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No. XVI. OF Vol. II., 1929. LONDON, SATURDAY, OCTOBER 19, 1929 Pp. 136 – Price 1s.
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MOBILISATION OF VISCERAL COATS.

When a portion of the gastro-intestinal tract is resected, union, whether by end-to-end suture or by lateral anastomosis after closure of the ends, must be effected. When Murphy introduced his button he did a great service to surgery, not only by evolving an ingenious instrument which has stood surgeons in good stead on many occasions when ordinary suture methods were impracticable, but mainly by proving that if accurate peritoneal apposition was obtained, elaborate layers of suturing were quite unnecessary.

Whilst leak from a suture line may be referable in some cases to sepsis, in others to inadequate blood-supply, it is in my opinion usually due to tension either in the long axis of the gut, due to inadequate mobilisation, to tension in the suture line, or to post-operative tension within the lumen of the gut. If free mobilisation of the ends to be joined has been effected, I believe that in the principle of mobilising the coats of the viscera to be joined so that the layers may be sutured together without any undue tension lies the secret of safe anastomosis. When we remember that the peritoneal and muscular coats of the hollow viscera offer but a slender hold for sutures, that the strength of the wall in every case lies in the submucous coat, we realise that safe approximation of the outer coats can only be accomplished if carried out with these coats completely relaxed. Such relaxation can only be secured, and this particularly in the colon, if these are first divided down to the submucous layer in each end of the bowel entering into the anastomosis. In the colon it is the longitudinal muscular bands which, being shorter than

the rest of the wall, render uniform relaxation difficult. Consequently division of the bands down to the submucous coat should be an essential step in all colon resections.

The employment of a single layer of interrupted Lembert sutures, lightly tied so as to give the minimum of interference with blood-supply, is, I believe, the ideal method of anastomosis, and the safest if the principle of "de-tension" be fully observed. The use of two or more layers of continuous suture drawn tight must inevitably strangulate a certain part of the sutured margins and the infected slough so formed will in a few cases determine a leak.

The last form of tension to be feared is tension from within. The evolution and retention of gas in the colon during the first few days after operation may bring about tension necrosis at a suture line otherwise perfect. To ensure against this nothing is so efficient as an appendicostomy, or, still better, a valvular tube-cæcostomy carried out on the principle of a Senn's gastrostomy. A colon tube passed per anum to beyond the anastomosis is less disturbing but hardly so efficient. Insurance against tension from within by a temporary valvular opening may be practised with advantage when resection of small intestine for acute obstruction is required, and the upper coils are sodden and dilated. Likewise an ileostomy after a resection of the proximal colon, where a subacute obstruction was present, may make the difference between a smooth and a stormy convalescence and may, indeed, be a life-saving measure.

These three elements—mobilisation of the viscus, mobilisation of its coats, and drainage of its lumen—are best exemplified in a case of resection for a tumour of the descending colon.

Free mobilisation of the growth having been secured by dividing the peritoneum and fascia propria along the outer side of the distal colon and by cutting the phrenicocolic ligament, the peritoneal and muscular coats are divided round the whole circumference of the gut at the two points chosen for division. Light clamps of the Shoemaker type are applied at these points and the colon is resected. The clamps are approximated and a posterior row of interrupted fine linen Lembert sutures is inserted and tied. An anterior row of similar sutures is now inserted over the clamps, which are then removed, and the sutures are lightly tied, the two ends of intestine coming together without the least tension, and the intramural blood-supply suffering a minimum of interruption. Through an incision in the right iliac region a valvular tube-cæcostomy is now instituted to obviate any gaseous distension.

Such an operation, based as it is throughout on the principle of "de-tension," is followed by singularly little discomfort and in my experience is one of the most satisfactory in the whole field of surgery.

Where, in the case of resection of either small or large intestine, it is deemed wiser to close the cut ends of the bowel and do a lateral anastomosis, the principle of mobilisation of coats is still more applicable. A circular incision down to the submucous coat will permit of the application of a catgut ligature and subsequent invagination of a diminutive stump with both rapidity and flaccidity. The cuff method of removing the vermiform appendix is an old and familiar practice. The same method applied to the small and large intestine is sound in principle and easy of performance.

Tension Due to Disease.

It is a basal fact in clinical observation that most abdominal pains, if we exclude those due to irritation of the parietal peritoneum, are due either to spasm of, or tension in, the hollow viscera. The establishment of a closed cul-de-sac in one of the hollow viscera, if its content be infected by living micro-organisms, is invariably followed by tension. If the content be composed of organic material capable of putrefaction the ensuing tension will be the more pronounced. Thus we know that the plugging of the neck of an infected gall-bladder by a calculus will be followed by an acute distension of the organ by a muco-purulent content, and that the tension may be so great that gangrene of the wall may ensue, particularly in elderly subjects. In such cases an operation which merely opens and drains the gall-bladder may be life-saving, however inadequate as a curative measure for the underlying disease. In the case of a strangulated loop of intestine, apart from the danger of obstructed blood-supply, we have to reckon that the putrefaction within the closed loop of intestine may in itself lead to such tension that gangrene of the wall may result. The organ, however, in which this factor of tension is found most frequently and with most baneful results is the vermiform appendix.

No man did more to bring home to the medical profession throughout the world the necessity for prompt and immediate operation in acute appendicular disease than did Murphy. How often and in what arresting language did he proclaim the urgency of early diagnosis and treatment in such disease! In one regard, however, Murphy's teaching on this subject was misleading. He insisted on a rise of temperature as one of the early and cardinal signs of acute appendicular disease. Murphy did not distinguish between the two primary and fundamental pathological processes which occur in the appendix—acute infection of its wall, and acute obstruction of its lumen. In the former a rise of temperature is natural and is invariable; in the latter it is absent during the early phase when diagnosis is all-important. No form of intra-abdominal tension demands our observation and respect so insistently as that of the acutely obstructed appendix, for here timely operation can with a minimum of risk remove a threatening danger, whilst delay inevitably means rupture with a peritonitis, oft-times fatal.

The death-rate from acute appendicular disease, both in this country and in Britain, has tended to increase rather than to diminish during the past decade. It is my firm conviction that over 90 per cent. of the deaths are in cases not of primary inflammation, but of primary obstruction of the appendix with resultant tension, gangrene, and perforation. If we would but visualise this disease as one of the fatal types of acute intestinal obstruction with the afebrile onset characteristic of such disease, demanding immediate operation before the tense, obstructed organ bursts; if we would teach our students its underlying pathology and demonstrate its characteristic clinical picture, we should not have to deplore a rising death-rate from so-called appendicitis. Van Zwalenburg has, I find, been teaching for more than 25 years the fundamental importance of the obstructive factor in acute appendicular disease. Whilst I cannot agree with him that in all cases obstruction precedes infection, I believe whole-heartedly that blocking of the lumen with tension is the real danger in appendicular disease.

Relief of Tension in Acute Peritonitis.

The much discussed problem as to whether drainage of the peritoneum is advantageous and effective in acute diffuse suppurative peritonitis is, to my mind, answered on this principle, that in so far as it relieves tension and permits of improved vascularity it is helpful. Thus in the case of diffused peritonitis where, on opening the peritoneum, purulent exudate gushes out, tension has obviously been present and a drain will obviate its recurrence. The fact that the drain is very rapidly shut off by intestinal adhesions is undeniable, but by that time it has served its purpose. As Murphy showed very clearly, in cases where drainage is most required adhesions round the tube form but slowly. We do well to remember his words: "Reduction of tension must be initial, and the absence of pressure continuous." The tension may, however, prove not to be due to peritoneal exudate but to intestinal distension. In cases where this factor is pronounced benefit will result from a cæcostomy or an enterostomy according as to whether the large or small intestine is most affected. Such relief of intra-intestinal tension will, among other influences, render a service to the inflamed peritoneum by permitting of more efficient blood-supply. In all cases in which cæcal distension

is a salient feature in the operative findings, a temporary valvular tube-cæcostomy is invaluable, not only as a safety-valve for gas but as an inlet for fluid to combat dehydration.

The Principle of Complete Assessment.

In no other region of the body do we find multiple pathological lesions so frequently as in the abdomen. Such multiple lesions may be associated on a common ætiological basis or may to all appearances be present by coincidence. An operation which cures one lesion and leaves behind another unrecognised may have all the stigmata of failure and is apt to bring discredit to surgery. It behoves us therefore in all abdominal operations, other than those of an emergency character for acute maladies, to be on the outlook for the commonly associated lesions and to exclude other gross pathological changes. I need but refer to the frequently associated lesions in the duodenum, appendix, and gall-bladder. It is my belief that all three are dependent on a streptococcal infection, and when found together, as they not infrequently are, should each be dealt with if a completely satisfactory result is to be assured. Within one year I met with a malignant stricture in the colon in three cases in which operation was undertaken for old-standing gall-bladder disease. In one of these an inadequate exploration failed to reveal the growth, which was only recognised when acute obstruction supervened during the convalescence.

Examples might easily be multiplied of dual lesions present at the time of operation and either recognised or missed according as to whether the assessment of pathology was thorough or incomplete. The two criteria necessary for such complete assessment, if delay and shock are to be avoided, are adequate anæsthesia and generous exposure. It is invaluable for future reference that the negative findings should be recorded. This was a characteristic of Murphy's work, and his constant refrain, "Let the record show," has been perpetuated as one of the most vital and important rules of the Hospital Standardisation Scheme of the College.

The Principle of the Two-stage Operation.

In the surgery of the abdomen, as in that of many other regions—e.g., the brain, the thyroid, and the prostate—we have learned that it is frequently not only desirable but wellnigh conditional for success that we proceed by stages to our ultimate operative goal. Many factors combine to make this surgery by stages a necessity. In abdominal maladies as in few others, the surgeon is often consulted for the first time in the presence of an acute crisis in the disease—e.g., in cases of acute obstruction of the stomach or large intestine, of intense cholæmia in obstructive jaundice, or of walled-off appendicular abscess. The immediate operative indication in any such case is clearly the minimum that will give relief and restore the patient to such condition as will permit of a radical treatment of the causal factor at a later date. The general toxæmia in such cases—the poisoned heart, liver, and kidneys—renders the patient an easy prey to complications if any major procedure is attempted, but further, the local conditions are thoroughly unsuitable both for operative work and for satisfactory repair. The tissues in and around the affected area are œdematous and friable, the bowel content frequently putrefying and highly infective, and the lymph channels draining the area laden with bacteria. A preliminary operation, whether it be a gastro-enterostomy in a stenosing pyloric carcinoma, a simple choledochostomy in biliary obstruction, a cæcostomy in a large bowel obstruction, or a simple drainage of an appendicular abscess, will give the necessary relief and a respite until toxæmia has passed. Nutrition is in a measure restored, the factors of local œdema tension, infected lymph channels and vascular stasis eliminated, and tissue calm restored.

It must be realised that no fixed length of interval between the preliminary and radical operation can be laid down, but that each case presents a problem demanding an individual exercise of surgical judgment. Apart altogether from the benefit accruing to the patient from this restorative interval, we know that the mere opening of the abdomen and the handling of the viscera calls forth a reaction which gives to the peritoneum an increased resistance to infection at the second operation. The latter deals with a peritoneum prepared and warned; there has been, as it were, a test mobilisation of the protective forces.

Whilst working at the subject of peritonitis 20 years ago with the object of testing whether a specific local immunity could be produced, I was impressed by the fact that the injection of any material whatsoever into the peritoneal cavity gave within 40 hours a markedly increased resistance to a lethal dose of micro-organisms. The material injected did not need to be bacterial, it required to be merely foreign material. The same increase in resistance could be secured by a preliminary opening of the abdomen and handling of the viscera. This called forth an immediate emigration of polymorph leucocytes, but later—and more important—a mobilisation from the omentum and mesenteries of large macrophages which could "stand to arms" the moment the infection arrived.

When it happens that a resection of some portion of the large bowel constitutes the second operation, an attempt may with advantage be made further to increase the patient's resistance to the possible infection which awaits him. We know that this infection is usually a mixed one—streptococcal and *B. coli*—and by suitable inoculation we may hope to obtain a certain degree of immunity. Since 1909 it has been my custom in all cases of excision of colon or rectum to give two preliminary injections of streptococcal and *B. coli* vaccine, the first given ten days, the second three days before operation, and to combine this with an injection of nucleic acid given 12 hours before the operation, the latter to call forth a leucocytosis. Experimentally I had found that this preliminary treatment gave in animals a definite increase of resistance to peritoneal infection, and I have reason to believe that it has a real value in human surgery. Recently at the Mayo Clinic intraperitoneal injections of vaccine, with the same object in view, have given encouraging results.

In referring to two-stage operations one must not omit to mention the Mikulicz-Paul operation of eventration of the growth in obstructing tumour of the colon. The advantages of this method of dealing with stenosing carcinoma of the pelvic colon in old and feeble subjects are well known. Whilst this practice is tedious it is eminently safe, especially if an interval of some months be allowed to elapse before an attempt is made to close the artificial anus.

The *on-dwelling clamp operation*, a modification of the Mikulicz-Paul method, has proved of great value in dealing with large growths in the lower half of the pelvic colon, especially in cases where multiple resections of intestine were required. In this class of case, when after resection the lower stump of pelvic colon reaches just up to the pelvic brim, an end-to-end anastomosis is difficult of performance, and the blood-supply of the lower end is precarious. By applying clamps with heavy handles to both ends of the colon, fixing the latter in apposition for one inch by interrupted sutures and fixing the clamped ends in the abdominal wound, removing the upper clamp in two days and leaving the lower one to slough off, one has repeatedly been able to deal successfully with tumours which appeared wellnigh inoperable. In several cases the lower stump has sloughed for an inch below the clamp but without untoward result. After the application of an enterotome an interval of two months is allowed to elapse. This interval permits of retraction of the ends of the colon, of a return of the tissues of the abdominal wall to normal suppleness and elasticity and, most important of all, of an immense betterment in the general condition of the patient.

The Principle of Replenishing Physiological Lack.

The cause of death in high intestinal obstruction is a subject which has attracted the intensive interest both of practical surgeons and laboratory workers. Gradually the factors which are operative in producing the condition of collapse, so characteristic of this type of obstruction, have been elucidated, and whilst much remains to be cleared up we have to-day in our possession a number of facts which point the way to ultimate solution of this difficult problem. Whilst doubtless a chemical substance of albumose type is absorbed from the distended bowel above the obstruction, and whilst drainage of this obstructed gut will give some relief, we know that death may yet ensue when free drainage is established. The pronounced dehydration which accompanies such obstruction and the call of the tissues for fluid is now recognised to be of primary importance and replenishment of body fluids the first indication in treatment. The very important fact that a notable and dangerous loss of chlorides occurs in such cases has led to the use of hypertonic saline injections with marked improvement in results. The aspect which I wish to emphasise, however, is that of the secretions which should normally descend into it from the upper portion.

We know that in animal experiments high obstruction with immediate drainage of the bowel is not survived for very much longer than an obstruction without drainage. The fluid, which in the bowel above the obstruction may appear to be toxic and threatening the patient's life, may be life-saving if introduced into the bowel below the obstruction. This fact was first borne in on me by a case of post-operative obstruction following acute appendicitis which is recorded in the *British Journal of Surgery* (1924, xi., 568), but to which I venture again to refer here.

In this case an enterostomy was performed but the coil opened was evidently below the really active obstruction, for no flow from the tube resulted. Later on the same day a second enterostomy was performed, this time on the highest jejunal coil, and a profuse discharge followed. In spite of copious saline infusion the patient continued to go downhill until the device of joining up the two enterostomy tubes was practised, when the abundant secretions from above the obstruction were conducted through the joined tubes to the intestine below. An immediate and remarkable improvement followed this manœuvre, and the patient made a satisfactory recovery and is alive and well to-day.

This call of deprivation of the empty intestine below in cases of high obstruction constitutes, I believe, an important principle in the treatment of such cases. R. St. L. Brockman has emphasised the benefit of enemata of bile in post-operative ileus, and has shown the important rôle which the absorption of bile from the lower reaches of the bowel has in liver function. There are, I believe, other factors besides bile in the profound physiological upset which results when an obstruction occurs between the active secretory upper part of the small intestine and the absorptive reaches below. The emptying of the upper distended coils at operation for acute obstruction of the small intestine, say from a band, may by reducing intra-abdominal tension permit of more vigorous peristalsis thereafter and thus be an advantage. It will not save the patient's life, however, unless subsequent peristalsis results in the propulsion of the content of the higher coils into the empty coils below. The conception of a physiological lack below, combined with a pathological retention above, is one which deserves our attention and will find a field for application in our practice.

CLAPHAM MATERNITY HOSPITAL.—This hospital, in Jeffrey's-road, London, S.W., which is staffed by medical women, is giving free training in midwifery to six daughters of unemployed Welsh miners. Last year, the annual report states, there were 798 maternity in-patients, 109 more than in 1927; 458 out-patients were attended in their own homes.

SYPHILITIC DISEASE OF THE PULMONARY ARTERIES,

WITH ACCOUNT OF A CASE.

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ANY case of arterial disease affecting the lesser circuit merits careful investigation because of the light it may throw on the problem of systemic arterial hypertrophy and degeneration.

In extreme cases of high pressure on the right side due to valvular disease of the heart, chronic bronchitis, and emphysema, &c., "the pulmonary artery suffers strain and injury more commonly than is supposed" (Allbutt [1]). The atheroma which may follow is, in Marchand's opinion, a crucial instance of atheroma due to high blood pressure. Posselt [2] (1909) was one of the first to point out that pulmonary atheroma arising as a result of chronic valvular disease of the heart could be held responsible for a definite clinical syndrome. Rogers,[3] in the same year, published the first account in this country of a similar clinical syndrome observed in Bengal, occurring in cases of syphilitic arterial disease affecting the vessels of the lesser circuit and independent of any valvular disease of the heart or chronic pulmonary condition. The next period of interest in diseases of the pulmonary arteries followed the publication (in the Argentine) of observations by Ayerza and by Arrillaga.[4] Following a more or less prolonged period of chronic pulmonary disease the Argentine cases developed cardiac symptoms with intense cyanosis (cardiacos negros) with dyspnœa, hæmoptysis, somnolence, and polycythæmia. These cases showed dilatation and disease of the pulmonary artery with extreme hypertrophy and dilatation of the right heart. Escudero[5] considered these cases as examples of pulmonary arteritis consecutive to syphilitic bronchitis. Veale and Coombs,[6] in 1915, in this country, and Mattirolo[7] and Gamna,[8] in 1921, in Italy, made other observations of importance, describing cases in which there was no evidence of syphilis, and no antecedent pulmonary or cardiac lesion responsible for the changes in the pulmonary artery. They established the existence (in a small number of cases) of a primary form of disease of the pulmonary artery.

Since this date there have been scattered references to the condition in the literature of nearly all countries. In France especially there has been increasing interest both in the primary (Durand,[9] 1927) and in the syphilitic form (Laubry and Thomas, Caussade and Tardieu, Darré and Albot, Trémolière, Tardieu, and Nativelle). In Italy Benedetto and de Castro [10] have published a comprehensive review (1928). In America (Bruce and Wilson, Bacon and Apfelbach) cases of the primary lesion have been described, and four cases of the syphilitic form have been published. (Cheney, Bruce and Wilson, Wharthin, Zeman).

That the syphilitic form of the disease is much the most common becomes a matter of importance when the symptomatology of the disease is considered. For, although syphilis is recognised in sanatorium practice as one cause of a destructive lesion of the lung simulating chronic ulcerative phthisis, it is not so frequently realised in out-patient practice that the *Spirochæta pallida* may also be responsible for a clinical state closely resembling chronic bronchitis and emphysema and usually diagnosed as such, while actually due to widespread endarteritis and periarteritis of the branches of the pulmonary artery.

Report of the Case.

The patient was a male house-porter aged 47. Previous army service for 14 years. Discharged in 1916 with tabes.

Possibly gassed, but army pension refused on ground of syphilitic infection. Mother had died of consumption.

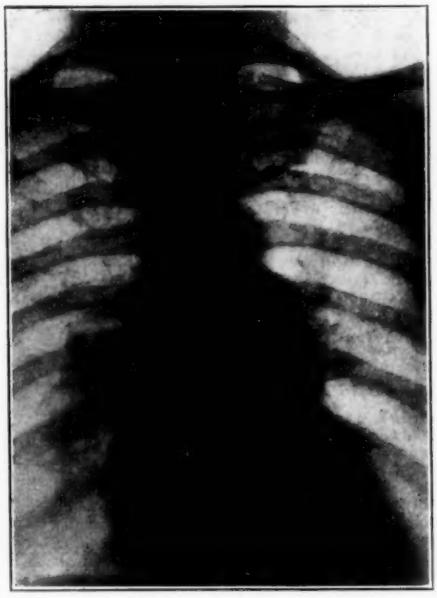
History.—Three years before the final illness he had attacks of giddiness and fainting; he fell down several times while at work. In the following year he had "bronchial asthma," and afterwards was unable to work, owing to breathlessness on exertion. Next year he had only one attack of faintness, but much discomfort from flatulence. He was in bed for six weeks before admission with œdema of legs during last three weeks.

Condition on Admission.—Admitted to Royal Free Hospital on Nov. 10th, 1928; he was in a distressed, dyspnœic condition, much cyanosed; pulse-rate 62, respirations 28. Venesection was performed a few hours later, the distress passed off gradually during first 24 hours, and no such acute attack recurred. Cyanosis of face and hands was present, but not extreme. No finger clubbing. Trunk was thin and there was a moderate degree of œdema of the legs, thighs, lower abdomen, and lumbar region.

He complained of sense of oppression over chest. Morning cough was infrequent and not paroxysmal; the sputum scanty, opaque, and muco-purulent. No tubercle bacilli were found. Respiratory movements were very poor, of diaphragmatic type, rate 20 to 24. The percussion note was not impaired; breath sounds were very weak, but otherwise normal. There were generalised sibilant and sonorous rhonchi. The heart was enlarged, but præcordial dullness could not be defined, owing to emphysema. The pulmonary second sound was accentuated and reduplicated. The pulse was of good volume and regular. The blood pressure was systolic 140, diastolic 110. He complained also of "flatulence." The bowels were regular. The abdomen was distended and rigid, with a small amount of free fluid. Palpation was difficult, but the liver was found to be enlarged to umbilicus, smooth, and not tender. The spleen was not palpable at any time.

A further complaint was of hesitancy on micturition and decrease in amount of urine. In hospital the amount of

FIG. 1.



Skiagram showing bulging of the middle arc of the cardiac shadow.

urine passed daily was 30 to 40 oz., with no albumin or other abnormality.

The pupils were irregular and unequal, and did not react to light. Knee- and ankle-jerks were absent.

Blood.—The Wassermann reaction (blood) was very slightly positive. The cerebro-spinal fluid was not examined. On Dec. 3rd the blood showed red blood cells 6,180,000 per c.mm.; hæmoglobin, 90 per cent.; colour-index, 0·75; white cells, 6900 per c.mm.

Electrocardiogram.—Report by Dr. Jenner Hoskin. Rate 76, regular. Marked right preponderance. T_1 adequate, T_2 and T_3 inverted. P_2 and P_3 large, suggesting auricular hypertrophy. Indicates changes in region of aortic base, at present right ventricle working adequately. (Nov. 20th, 1928.)

Skiagram (Fig. 1).—The following report was made by Dr. Ulysses Williams: "Generalised emphysema of moderate intensity, and distributed fairly uniformly throughout both lungs, more marked at the bases, especially the right. The interstitial fibrous tissue is about normal for a man of

FIG. 2.

Left lung. Arteries laid open to show atheromatosis.

this age. Great enlargement of the first part of the pulmonary artery, and owing to the great hypertrophy of the right ventricle, and the rotation to the left of the whole heart, the base of the pulmonary shows more than usual."

Course.—The outstanding symptoms were attacks of great abdominal discomfort, described by the patient as due to flatulence, with tightness of the chest; usually nocturnal, preventing sleep. There was definite improvement for first four weeks. The liver shrank, the circumference of the abdomen fell from 35 in. to 31 in., the œdema disappeared. Later these symptoms, together with almost complete anorexia, reappeared. The liver increased in size, forming a prominence in the epigastrium. Some epigastric pulsation was present. A coarse systolic murmur, probably exocardial in origin, developed over the lower end of the sternum. The heart gradually failed, sleep became more disturbed, and the patient died on Jan. 10th, 1929, two months after admission.

Post-mortem Examination.

Externally considerable œdema of lower limbs, cyanosis of face, cyanosis of ears striking.

Thorax.—Universal pleural adhesions which separated with difficulty. Pericardial cavity contained a slight excess of fluid. Coronary sinus not abnormal in size. Visceral pericardium white and opaque over anterior surface of right ventricle and over whole of right auricle.

Lungs.—Somewhat deformed. Hard nodules palpable in subpleural tissue and in the substance of the lungs. Pleura thickened. On section, upper lobes extreme emphysema, fibrous nodules inconspicuous, lower lobes less emphysema, nodular fibrosis widespread. Fibrosis marked towards roof of lungs here in form of strands of fibrous tissue rather than nodules. Intrapulmonary branches of pulmonary artery showed dilatation and numerous yellow intimal plaques of atheroma. These could be seen in all vessels down to those of 3 mm. in diameter (Figs. 2 and 3). The bronchi showed no gross change.

Heart.—Externally enlarged. Right ventricle lay entirely in front of left, forming apex of heart.

	Right Heart.	*Left Heart.*
Cavities	Greatly dilated	Normal.
Valves	Tricuspid normal	Mitral normal.
	Pulmonary ,,	Aortic ,,
Myocardium	Firm and dark	Brownish in colour. Some subendocardial fibrosis.
Ventricle wall: thickness at apex.	9 mm. (Normal, 2·5–3 mm.)	12 mm. (Normal, 9–12 mm.).
Circumference at orifice.	Pulmonary 9·35 cm. (Normal 8·5–9 cm.)	Aortic 6·75 cm. (Normal 7·7–8 cm.)

Ratio of circumference of pulmonary artery to that of aortic, 1·38. Normal, 1·1.

Coronary vessels: Normal.

Aorta.—First part of arch and upper half of the thoracic aorta showed considerable change. Intima, irregular pitting and depressions, some stellate. Pearly-white scarring. Also

yellowish raised patches with calcification and, in first part, some ulceration. Changes became less severe and terminated somewhat abruptly about halfway down the thoracic vessel. The appearances suggested syphilitic mesaortitis with superimposed atheroma. The abdominal aorta showed no change, nor did the vessels of spleen, liver, and kidneys show any abnormality.

Pulmonary Artery.—Main vessel. Lumen dilated, some slight thickening of walls. Intima, no naked-eye changes. Main branches, some intimal change, but no large patches of atheroma till the root of the lung was reached (Figs. 2 and 3).

Spinal Cord.—Naked-eye and microscopic changes typical of tabes. Pal-Weigert preparations showed symmetrical degeneration in posterior columns.

The other viscera showed no changes of any importance except those due to congestive heart failure.

FIG. 3.

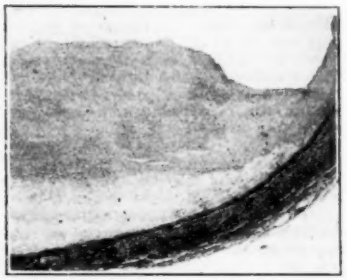
Right lung. Arteries laid open. The walls of the vessels are thickened, their course tortuous; the atheroma is more severe in the smaller vessels.

Histopathology.

The *aorta* showed vascular invasion of the media with accompanying lymphocytic and plasma cell infiltration typical of syphilis, and a superadded atheroma and some calcification.

Pulmonary Artery.—(1) Vessels over 3 mm. in diameter: The main vessel had slight thickening of its walls, mainly due to increase of thickness of the strong band of elastic tissue visible in longitudinal section. The elastic tissue of the outer part of media was increased in amount, but here showed localised fibrous tissue areas. The intima, even in areas which appeared normal to the naked eye, showed some increase in fibrous tissue. The right and left pulmonaries and their larger branches showed atheroma without calcium deposit. There was no evidence of any inflammatory change (Figs. 2, 3, 4). (2) Vessels about the diameter of 3 mm.: Some of these showed invasion of their walls by lymphocytes and plasma cells. Atheroma present at the same time. There was periarterial fibrosis. (3) Vessels smaller than 3 mm.: The change was severe and took the form of a chronic panarteritis. In some of the vessels (Figs. 5 and 6) the lumen was almost obliterated owing to proliferation of the intima. In vessels lying near the more cellular areas of fibrosis the arteritis was subacute and some plasma cells and lymphocytes were present in the wall.

FIG. 4.



Right pulmonary artery. Longitudinal section through a plaque of atheroma.

Lung: Fibrous Nodules.—Occasionally truly perivascular, the vessel lying in the centre of the nodule. More often the nodules lie near the vessels. In the subpleural region these nodules were vascular and showed a considerable amount of cellular infiltration (Fig. 7), and, since they contained elastic tissue deposed more or less regularly throughout, they may be supposed to have arisen by the obliteration of alveoli. There was a carbon deposit. Some of the nodules in the substance of the lung contained numerous lymphocytes and plasma cells, with an occasional giant cell.

Alveoli.—The changes in the alveoli in the neighbourhood of the sclerotic patches were: (*a*) proliferative. The alveolar lining cells were cubical and in places filled the entire lumen. Macrophages, laden with brown pigment, were present in large numbers (Fig. 8); (*b*) obliterative. Plasma cell and lymphocytic infiltration and, later, a development of collagenous connective tissue.

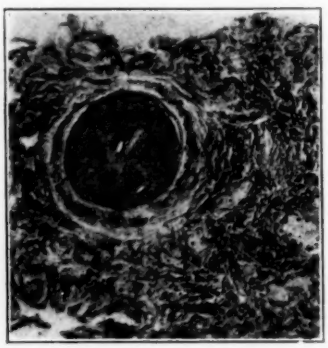
In other parts of the lung high-grade emphysema was present.

Bronchi.—The changes in the bronchi were relatively slight and of the nature of a compression rather than actual involvement in the inflammatory process. In some bronchioles involved in the sclerosis of the lung parenchyma the epithelium showed squamous metaplasia.

FIG. 5.

Artery in substance of lung showing extreme obliterative endarteritis, perivascular fibrosis with carbon deposit, and some infiltration by lymphocytes and plasma cells.

FIG. 6.



Subpleural arteriole, showing almost complete obliteration of lumen.

Clinical Summary.

Twelve years' history of tabes dorsalis. Blood Wassermann slight positive. Two years' severe progressive dyspnœa, accompanied by asthma and cyanosis. A few weeks' œdema of legs. Progressive right heart failure with regular pulse.

Summary of Post-mortem Examination.

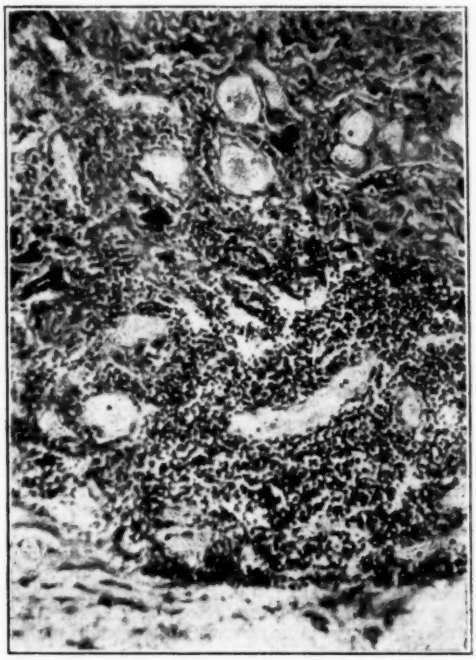
1. Chronic bilateral pleurisy with dense universal adhesion. 2. Chronic vesicular emphysema. 3. Diffuse and nodular fibrosis of both lungs, equal in the two sides. Emphysema of high grade in both upper lobes

and here fibrosis inconspicuous. Fibrosis marked at the roots and in lower lobes and here emphysema less. Nodular fibrosis present throughout both lungs, both subpleural and in their substance. 4. Marked hypertrophy and dilatation of the right heart. 5. Universal atheromatosis of the main right and left pulmonary arteries and their larger branches. Main vessel spared. 6. Widespread periarteritis and obliterating endarteritis of intrapulmonary branches of the pulmonary arteries; severe and accompanied by periarterial inflammatory changes in almost all vessels from 3 mm. diameter to precapillaries. 7. Mesaortitis and atheromatosis of thoracic aorta. 8. Degeneration of the posterior column of the spinal cord. 9. Chronic venous congestion of viscera.

Review of Cases.

Vaquez [11] has suggested the division of cases of sclerosis of the pulmonary arteries into two broad groups, "sclérose complication" and "sclérose

FIG. 7.



Section of subpleural fibrous nodule, showing new formation of vessels, carbon deposit, numerous lymphocytes, and plasma cells.

maladie." In the first group the changes in the pulmonary artery arise as a complication of some antecedent cardiac or pulmonary condition and the clinical signs and symptoms of the underlying morbid changes are usually apparent. In the second group (and it is to this group that the present case belongs) the signs and symptoms are those due to or consecutive to the alterations in the pulmonary vessels themselves. That this second group does not consist of cases having a common ætiological basis is clear from the scrutiny of the published cases in the recent literature.

In reviewing these cases of arterial disease, confined or largely confined to the pulmonary circuit, it is proposed to disregard those cases with no post-mortem and those in which no exact pathological (based on histological evidence) diagnosis is possible. Only cases in Vaquez's second group will be considered. That such a restriction curtails the number of cases reviewed is obvious and some series of cases, notably five cases reported by Eppinger and Wagner,[12] are omitted on the grounds of inadequate histological reports.

It will be seen that among the collected cases many are syphilitic in origin. The diagnosis of syphilis has rested upon (1) the Wassermann reaction; (2) the presence of other stigmata of syphilis, especially aortitis; (3) the histological changes in the pulmonary vessels and in the lung itself. The final decision for or against syphilis rests upon the histological examination of the pulmonary vessels.

FIG. 8.

Proliferative changes in alveoli at the margin of a fibrous nodule.

Wassermann Positive or Strongly Positive (11 Cases).—All showed syphilitic arteritis of small pulmonary vessels. In addition aortitis in six cases (Nos. 6, 8, 10, 16, 17, 24). Arteritis of main pulmonary in ten cases (Nos. 2, 6, 8, 10, 12, 13, 14, 16, 17, 24). Tabes dorsalis in one case (No. 10). Alveolar lesions in three cases (Nos. 2, 10, 24).

Wassermann Very Slightly Positive (2 Cases).—One showed syphilitic arteritis of small pulmonary vessels and in addition aortitis, tabes dorsalis, alveolar lesions (No. 1). One showed no other evidence of syphilis, and the vascular lesions were non-inflammatory (No. 4).

Table of Collected Cases of Acquired Disease of the Pulmonary Artery.

No.	Authors.	Source.	Age.	Sex.	Syphilis.
1	—	Present case.	47	M.	Yes
2	Ajello, L.	Policlin., 1928, xxxv., 461.	29	M.	Yes
3	Bacon, C. M., and Apfelbach, C. W.	Trans. Chicago Path. Soc., 1927, xii., 293.	40	F.	No
4	Benedetto, P., and de Castro, C.	Cuore e Circolaz., 1927, xi., 353.	14	F.	No
5	Bruce, J. D., and Wilson, F. N.	Ann. Clin. Med., 1926, v., 9.	28	F.	No
6	Ditto	Ibid., p. 15.	53	M.	Yes
7	Caussade, G., and Tardieu, A.	Bull. Soc. Méd. Hôp. de Paris, 1928, lii., 871.	40	M.	Yes
8	Cheney, G.	Amer. Jour. Med. Sci., 1927, clxxiv., 34.	47	F.	Yes
9	Clarke, R. C., Coombs, C., and Hadfield, G.	Quart. Jour. Med., 1927, xxi., 51.	22	F.	No
10	Ditto.	Ibid., 60.	39	F.	Yes
11	Darré, H., and Albot, G.	Ann. d'anat. Path. et Méd., 1928, v., 861.	56	M.	Yes
12	Laubry, W., and Thomas, M.	Bull. Soc. Méd. Hôp. de Paris, 1927, li., 9.	38	M.	Yes
13	Ditto	Ditto	36	M.	Yes
14	Ditto	Ditto	45	F.	Yes
15	Ditto	Ditto	60	M.	Yes
16	Ditto	Ditto	59	F.	Yes
17	Ditto	Ditto	58	—	Yes
18	Ditto	Ditto	48	M.	Dbt.
19	Ditto	Ditto	39	M.	,,
20	Lang, G.	Deut. Arch. f. klin. med., 1924, cxliii., 359.	45	F.	No
21	Trémolière, F., Tardieu, A. and Nativelle, R.	Bull. Soc. Méd. Hôp. de Paris, 1928, lii., 860.	42	M.	Yes
22	Wätjen, J.	Deut. med. Woch., 1924, i., 713.	11/12	F.	No
23	Wharthin, A. Scott	Contr. to Med. and Biol. Res., 1919, ii., 1042.	53	M.	Yes
24	Zeman, F. D.	Proc. New York Path. Soc., 1923, xxiii., 58.	53	M.	Yes

Dbt. = doubtful.

N.B.—In referring to these cases in the text the number in the left-hand column will be quoted in brackets—e.g., (No. 11) refers to the case reported by Darré and Albot.

Wassermann Negative (3 Cases).—None showed any inflammatory element in the lesions of the pulmonary artery. Two showed no evidence of syphilis (Nos. 3 and 5). One had a definite history of syphilis (No. 19).

Wassermann, no Record (8 Cases).—Four cases showed arteritis of the small pulmonary vessels (Nos. 7, 11, 21, 23). In addition: aortitis (Nos. 11, 23). Arteritis main pulmonary (Nos. 11, 23). Alveolar lesions (Nos. 7, 11, 21). One case showed arteritis consecutive to typhus (No. 20). Three cases showed non-inflammatory lesions of the pulmonary vessels. No ætiological factor (No. 9). History of syphilis and bronchitis (No. 18). Congenital stenosis of pulmonary veins (No. 22).

The total number of cases under review is 24, and they may be divided into the following groups: (1) 16 diagnosed as having a syphilitic basis; (2) two in syphilitics with non-specific histology of arteries; (3) one following typhus; and (4) five diagnosed as primary. The average age of syphilitics is 47·8, of the primary cases 21, and of those in groups (2) and (4) 27·5. In groups (2) and (4) combined the oldest case (49) had a definite syphilitic history; the histology of the arteries was not diagnostic. None of the others was over 40. In group (1), in which the youngest was 29, only four were under 40.

We may draw two conclusions from these figures—viz., that syphilis is by far the more important ætiological factor in older patients, and that primary sclerosis of unknown ætiology is found in younger patients.

In the analysis of the post-mortem findings and the clinical signs and symptoms which follow reference is only made to the syphilitic cases.

Lesions in the Pulmonary Vessels and Lungs.

1. *Main Pulmonary Artery and Extrapulmonary Branches.*—Thomas[13] points out that, although the classical conception of the distribution of syphilitic vascular disease is that syphilis attacks the aorta, but respects the pulmonary circulation, in his series of cases there are numerous instances of both vessels being attacked. (Out of 10 cases showing arteritis of the pulmonary artery six had aortic lesions.) He shows that in some cases the aortic lesions are considerable, while the pulmonary artery is only mildly damaged, but that in other cases the alterations in the two vessels are of equal importance. Some of the cases described by Thomas are not included in the present series since the aortic lesion provides the clinical phenomena. Taking all the collected cases it is interesting to analyse the frequency with which syphilitic lesions of the main pulmonary vessels and syphilis of the aorta are associated with syphilitic arteritis of the smaller branches of the pulmonary artery. In 16 cases there was syphilitic arteritis of small pulmonary vessels:—

In 12 with main pulmonary and right and left pulmonary artery syphilitic: aorta syphilitic in 7, aorta normal in 5.

In two with main pulmonary and right and left pulmonary arteries, showing athero-sclerosis: aorta syphilitic in one; normal in one.

In two with main pulmonary and right and left pulmonary arteries, showing dilatation only; aorta normal in both.

These figures show that in syphilitics with an initial vascular lesion of the smaller pulmonary arteries the main pulmonary artery and its branches are more often (12 cases) affected than is the aorta (8 cases). The lesions in the large pulmonary vessels when purely syphilitic are similar to the classical picture of syphilitic mesaortitis due to syphilis. There is, in nearly all cases, superimposed athero-sclerosis. The vessel may be very greatly dilated. The ratio of the circumference of the pulmonary artery to that of the aorta is increased to 1·3 (No. 10), 1·38 (No. 1), 1·4 (No. 2), normal 1·1. In one case (No. 14) there was a saccular aneurysm of the pulmonary artery.

Thomas in his thesis states that the syphilitic lesions scattered and not intense in the trunk and great branches are more numerous and widespread in the branches at the hilum and in the medium and small branches; the majority of the collected cases show the same distribution. Trémolière, Tardieu, and Nativelle in their case, which also showed mitral stenosis, found the most severe lesions in the smaller vessels (about 5 mm. diam.) and in the trunk and first branches no longer specific panarteritis, but athero-sclerosis with atheroma (No. 21). The present case (No. 1) shows a similar distribution—whereas syphilitic arteritis was generalised throughout the intrapulmonary branches of the artery and most severe in the arterioles, the vessels at the hilum showed only slight inflammation with considerable athero-sclerosis and the trunk and first branches athero-sclerosis alone. Only one case in the series showed as healthy main pulmonary and healthy large branches (No. 7), the infundibulum of the artery alone showing dilatation.

2. *Intrapulmonary Vessels.*—All the cases show lesions in the intrapulmonary branches of the pulmonary artery. These lesions are more or less widespread (Nos. 11, 14), but tend to differ in severity and activity in the vessels of different calibre. In one case the lesions are stated to have been most severe in the vessels of the second and third degree (No. 23). In others the arterioles show the most extreme alterations (Nos. 1 and 10). The typical lesion is a panarteritis usually of a subacute form. All the vascular coats are altered and are infiltrated by plasma cells and lymphocytes with newly formed capillaries passing into the media and even to the intima (Thomas). The intima is thickened and the lumen may be partly or completely obliterated. Chronic panarteritis with periarterial fibrosis, with in some instances hyperplasia and in some cases destruction of the elastic tissue of the media (Thomas) may be present. Thrombosis occurs with considerable frequency. This may have been an incident during the course of the disease (Nos. 2, 7, 10, 21) or thrombosis with infarction of the lung may supervene without premonitory symptoms (No. 13). In some cases thrombosis has been followed by organisation with recanalisation, and a collateral circulation may have been established with a localised production of dilated blood-vessels (No. 2).

There is considerable uniformity in the vascular lesions throughout the series. Darré and Albot (No. 11) describe lesions which are identical with those in the present case. Trémolière, Tardieu and Nativelle and Thomas give valuable accounts of the vascular changes.

3. *Lung.*—Nearly all cases show the changes due to chronic congestion. Many cases show an extreme degree of emphysema (Nos. 1, 6, 8, 23, 24), in some there is a terminal œdema (Nos. 7, 13, 15, 21, 24), and infarcts of varying age were present in six cases (Nos. 11, 12, 13, 15, 16, 21). Lesions which can be truly referred to the results of syphilis are present in seven cases (Nos. 1, 2, 7, 10, 11, 21, 24). The changes take two forms: fibrosis spreading in broad bands throughout the lung and having origin in the dense fibrous tissue around the vessels (No. 10), and nodular areas of fibrosis.

The origin of the nodular areas of fibrosis may be interstitial or intra-alveolar. The interstitial nodules arise by organisation of perivascular or subpleural foci of lymphocytic infiltration. Such foci were described by Letulle and Dalsace[14] under the title of nodular cortico pleuritis, as one of the forms of latent syphilis of the lung reported by those authors. In later stages these foci become fibrous and often very vascular (Nos. 1, 7, 11). The intra-alveolar origin of fibrous tissue is described by French authors as "alveolite végétante." Alveoli or groups of alveoli become airless and filled with desquamated cells, many of which are loaded with brown pigment. Some mononuclear cells are also present. There is proliferation of the alveolar epithelium which has become cubical. Later the cells disappear and collagenous fibres take their place. Pigment may remain among the fibres. In sections stained with Weigert's elastic stain the remains of the alveolar walls can be made out in the resultant fibrous

nodule (Nos. 1, 7, 11). In some cases true miliary gummatous foci are described (Nos. 1, 2, 21).

4. *Bronchi.*—The changes in the bronchi are slight in nearly all cases. Some catarrhal inflammation is reported (Nos. 8, 10) and some epithelial metaplasia (Nos. 1, 11). In one case only is there any evidence of the bronchial lesion being syphilitic and antecedent to or of the same age as the arterial lesion (No. 15). In reporting this case Thomas describes it as being a case of syphilitic arteritis arising in the course of bronchial syphilis, and therefore comparable to the cases described as "Ayerza's disease" by Escudero.

Changes in the Heart and Other Organs.

Two of the cases in this series had some degree of mitral stenosis (Nos. 7 and 21). None of the others showed any valvular disease. The characteristic change in the heart is great hypertrophy and dilatation of the right side of the heart. The right ventricle forms the whole anterior surface and the apex of the heart (Nos. 1, 2, 10, 12). The wall is extremely thickened, 2·5 times or even 3 times normal (Nos. 10, 8, 1). In one case the enlargement of the heart, which was very great, was due almost entirely to dilatation (No. 23). In this case also the right auricle formed about one-third of the heart bulk, but in the majority of cases the right auricle was dilated and hypertrophied in proportion to the changes in the right ventricle. The left ventricle shows hypertrophy and dilatation in some cases (Nos. 6, 7, 13, 14, 15, 17, 23).

This series of cases shows no lesions of any importance in the other organs beyond those due to chronic venous congestion. No case of splenic enlargement is reported.

Clinical Review.

In reviewing the cases an attempt has been made to determine which symptoms give the disease, syphilitic arteritis of the pulmonary artery, a true entity and distinguish it from other affections of the pulmonary artery.

The diagnosis from alterations in the pulmonary artery secondary to some underlying cause in the lungs or heart rests with the presence of the symptoms and signs of the underlying lesion. The syphilitic arteritis following on a prolonged history of chronic bronchitis (Ayerza, Arrillaga, Escudero) in the syphilitic subject may produce a terminal clinical picture not unlike the cases under discussion. The history and signs of severe bronchial damage must be taken into consideration. In distinguishing between syphilitic arteritis and non-syphilitic primary sclerosis there is no sure method; only the age and history of the patient will be of assistance.

Symptoms.

Two symptoms take on a significance of the first importance; they are of insidious development and follow a progressive course during the clinical history. These are dyspnœa and cyanosis.

Dyspnœa makes its earliest appearance as dyspnœa on exertion. This may be the only symptom for as long a period as four years (Nos. 6, 7, 11). Nocturnal paroxysmal attacks are frequent (Nos. 6, 7, 14, 21, 23). Later dyspnœa becomes constant with attacks of orthopnœa.

Cyanosis is one of the most characteristic signs but it may be early or late in its appearance and varies greatly in its intensity. Eight cases showed intense cyanosis. Where radiological reports are given it is found that intense cyanosis is associated with increase in the hilar shadows and enlargement of the middle left arc of the cardiac shadow, confirming the views expressed by Thomas that cyanosis in these cases does not appear without general dilatation of the main pulmonary vessels. In some cases (No. 23) cyanosis may be constant, while during attacks of dyspnœa and thoracic discomfort the cyanosis deepens to "black."

Other Symptoms.—A sense of oppression in the thorax (Nos. 1, 8, 23) is sometimes present, often coming on after exertion or during attacks of dyspnœa and increased cyanosis (No. 23). None of these cases has complained of severe pain, such as is described as "angor cæruleus," "angine pulmonaire hypercyanotique," &c. (Vaquez). *Hæmoptysis* may be due to purely vascular change or due to thrombosis with infarction. Hæmoptysis was slight in four cases and profuse in two cases. One case (No. 13) had slight hæmoptysis for three years and then had a sudden attack of hæmoptysis with cyanosis two months before death. This later hæmoptysis was due to thrombus formation in the middle branch of the right pulmonary artery with infarction of nearly the whole of the middle lobe of the lung. On the other hand quite extensive thrombosis or infarction may take place without hæmoptysis (No. 11). *Palpitations* occur during the course but are not constant. *Attacks of vertigo* may be the earliest symptom (No. 1, 2) or may occur later (No. 6). *Somnolence* has been described as a constant and characteristic symptom by various writers but in the present series only two (Nos. 21, 23) cases are reported as showing this symptom. *Clubbing of the fingers* is not described in these cases. It appears to be present in nearly all cases where alterations in the pulmonary artery are secondary to lung or bronchial conditions.

Physical Signs.

The clinical examination of these cases allows the exclusion of more usual causes of cyanosis and dyspnœa by ruling out chronic pulmonary conditions, congenital lesions, or acquired valvular disease of the heart, &c. The total absence of physical signs is one of the most characteristic peculiarities of primary arteritis or sclerosis of the pulmonary artery.

Cardiac.—The pulse is regular. The heart is enlarged both to right and left. The only alteration in the cardiac sounds which appears to be constant is that of reduplication or accentuation of the pulmonary second sound—occasionally a diastolic murmur of pulmonary insufficiency symptomatic of dilatation of the pulmonary artery (Thomas, No. 16). Later, signs of right heart failure or of total cardiac failure appear. Thomas describes a gallop rhythm in many of his cases (Nos. 12, 14, 15, 16, 17, 18) and in some refers it to the right ventricle (Nos. 14, 15).

Pulmonary.—There are no constant physical signs in the lungs. Signs of emphysema or various râles may be present.

Œdema is present in all cases and varies in intensity, some cases showing œdema of the hands, feet, and legs, some showing generalised anasarca (No. 24) or ascites (Nos. 2, 6, 12) in addition. The spleen is not enlarged in the majority of cases (exception No. 23).

Special Examinations.

The Blood.—There are eight records of the number of red blood corpuscles. The counts vary from 5,200,000 to 8,760,000, the average being 6,605,000. There are only six records of the leucocyte count giving an average of 11,160. The counts in individual cases may vary from time to time. In two cases two results are given (No. 15), 5,500,000–7,000,000 and (No. 23) 7,200,000–8,760,000.

The *electrocardiogram* gives valuable information about the state of the right ventricle. There are reports in three cases which correspond fairly closely. Right ventricular preponderance. Rate increased. No arrhythmia in two cases, occasional extrasystoles in one. Inversion of T_2 and T_3 and P_2 large, suggesting auricular hypertrophy.

Radiography.—There are radiographic reports in ten cases. Examination by X rays gives the most characteristic findings and the radiographic appearances are fully discussed by Thomas in his thesis. He points out that the characteristic findings are:

(1) Increase in length and projection of the left middle arc (Nos. 1, 12, 18, 21). (2) Increase in size of the arterial shadows at the hilum with pulsation greater in amplitude and more visible than normally (No. 21). (3) The branches of the pulmonary arteries show more clearly than normal

and can be followed in their course towards the periphery of lung. Some cases show pulsation (No. 14).

These three points he refers to the increased arterial tension.

(4) Modifications of the cardiac shadow due to the enlarged right ventricle with enlargement of the infundibulum of the pulmonary artery and rotation of the heart, causing bulging of the middle arc. (5) When pulmonary insufficiency is present "La danse hilaire" can be seen. The hilar shadows are seen to move with expansile impulses with each beat of the heart. The aneurysm of the pulmonary artery in No. 12 was diagnosed from the radiological examination.

Skiagrams also show the presence of fibrosis whether spreading from the hilum or in the substance of the lung (Nos. 11, 21), and may show the presence of infarcts.

Conclusions.

A well-defined group of cases exists in which arterial disease is confined or largely confined to the pulmonary circuit. These cases differ from other cases with arterial lesions in the lesser circuit in that there is no antecedent pulmonary, cardiac, or bronchial lesion. Twenty-three fully reported cases have been collected from the literature, and a further case is now described.

It is found that syphilis is by far the most important ætiological factor in older patients. Primary non-inflammatory sclerosis of unknown ætiology is found in younger patients. In the syphilitic cases the lesions in the intrapulmonary arteries take the form of an obliterative arteritis, usually most severe in the smaller branches and arterioles. This condition leads to a raised blood pressure in the lesser circuit. Dilatation and hypertrophy of the main pulmonary artery follows with atheroma of the right and left pulmonary arteries and larger branches, whether the latter show inflammatory lesions or not. The right side of the heart becomes greatly dilated and hypertrophied. Clinically the cases are characterised by dyspnœa, cyanosis, and hæmoptysis, and in the later stages by progressive congestive heart failure with a regular pulse.

Syphilitic arteritis of the pulmonary arteries, while admittedly rare, is worthy of notice, since by early diagnosis antisyphilitic treatment might afford some hope of amelioration of the symptoms.

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A BIRMINGHAM POOR-LAW HOSPITAL.—The Birmingham Board of Guardians have adopted a scheme for the enlargement of their Dudley Road Hospital at a cost of £80,000. The pressure upon the institution has become very severe. The in-patients have increased from 8867 in 1924 to 13,232 in the year ended with March last; in the same period out-patients grew from 3701 to 17,063. So great is the pressure that of late non-resident nurses have had to be engaged, an expensive process justified only by the lack of accommodation. The existing nurses' home holds 103 nurses, 49 live in adjoining buildings, and over 90 are housed in hospital wards. The proposed extension of the home will accommodate 142 nurses, and is so planned as to permit conveniently of further enlargement. It is intended in the near future to provide a new mortuary, and post-mortem and pathological departments.

SUBCUTANEOUS NODULES IN THE SCALP

IN FATAL CASES OF GLANDULAR ENLARGEMENT WITH MONONUCLEOSIS.

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THE following two cases present such a remarkable likeness to one another, and such unusual signs and symptoms, that they seemed to us worthy of record, the more so because in one of the cases a post-mortem examination was carried out. How to give a title to this contribution which will enable others to recognise the condition we are attempting to describe is in itself a difficulty, and equally difficult for the same reason is a search of the literature for similar cases. Their interest is increased by the great difficulty in diagnosis, and the liability of falling into the mistake of calling such a case one of rheumatism. It is an interesting fact that rheumatic symptoms are not uncommon among the early warnings of such fatal diseases in childhood as the leukæmias and the grave anæmias. Radiographic appearances in these two cases seem to us to throw some light on these symptoms, though this by no means explains the swelling of the wrists in the second case, which were suggestive in their appearance of Still's disease.

Account of Two Cases.

CASE 1.—A boy, aged 3 years and 3 months, was admitted to the Hospital for Sick Children on Oct. 5th, 1928. He was the only child of parents who are first cousins. He was breast fed as a baby, and remained perfectly healthy up to the beginning of 1928, when he twice had bronchitis. In April, 1928, enlarged glands first appeared in the right side of his neck, and two weeks later he developed some fever, with pain and swelling of his joints. These swellings were fleeting in character, and affected the ankles, knees, wrists, and elbows. During this illness the glands became enlarged in both sides of the neck and in both groins, and these glands remained large up to the time of admission. In June, 1928, the pains in the legs recurred, and the boy was admitted to the Metropolitan Hospital, where he remained for two months, when he was removed by his parents.

The house physician at the Metropolitan Hospital kindly furnished some particulars of the investigations carried out there. A gland was excised, and the pathological report said: "No evidence of new growth: there is some hyperplasia, but nothing to suggest lymphadenoma." A blood count showed a secondary anæmia with a slight leucocytosis (19,000 per c.mm.), and the differential leucocyte count was normal. The Wassermann reaction was negative.

The boy's condition became worse after discharge from the Metropolitan Hospital, and he was sent to the Hospital for Sick Children.

On admission he was a pale boy, with a somewhat puffy face, of average development for his age. There were masses of enlarged, discrete glands on each side of the neck and on the posterior aspect beneath the occiput. The axillary, inguinal, and epitrochlear glands were also considerably enlarged, and over the mass of glands on the right side of the neck—the largest collection—were many dilated venules. Scattered over the skull were several small hard masses, about the size of a pea, not fixed to the bone, and apparently in the scalp. There were similar swellings, rather more fixed, deep to each eyebrow. The heart was not enlarged, there were no murmurs to be heard, but the first sound was very short and accentuated. The pulse was rapid, 140 per minute, soft, and of poor volume. The temperature was normal. The abdomen was slightly distended, the liver being enlarged about two fingers-breadth below the costal margin, while the spleen was not palpable. There were no signs of disease in the respiratory or central nervous system, and the urine was normal.

Progress.—The pulse remained very rapid, and the swellings on the head became more enlarged. The temperature was now raised, and had a swinging character. Pain occurred in the regions of the left elbow-joint and the right knee.

Radiographic examination showed evidence of rarefaction in the regions where pain was experienced (see figure), and the appearances suggested infiltration of new growth. The parotid glands became enlarged, and on Oct. 20th the spleen became palpable for the first time. The boy's condition became worse, the temperature being more raised, often as

Radiogram showing rarefied areas at end of long bones.

high as 102° to 103° F., the pulse was more rapid, 160 to 180 per minute, and the glands became more enlarged, especially in the parotid region. There were no hæmorrhages to be found anywhere over the body nor in the retinæ. He was removed by his parents on Nov. 3rd, and died at home two weeks later with great abdominal distension.

The blood counts in this condition were very puzzling, and are summarised in Table I.

TABLE I.

Date in 1928 ..	Oct. 5th.	Oct. 19th.	Oct. 28th.
	Per c.mm.	Per c.mm.	Per c.mm.
Red corpuscles	3,700,000	3,237,500	2,637,000
Hæmoglobin	40 %	25 %	25 %
	Per c.mm.	Per c.mm.	Per c.mm.
White corpuscles	10,000	32,000	62,000
Polymorphs	29 % (2,900)	8 % (2,560)	6 % (3,720)
Small lymphocytes ..	52 % (5,200)	32 % (10,240)	3 % (1,860)
Large lymphocytes ..	12 % (1,200)	60 % (19,200)	83 % (42,460)
Mononuclears	2 % (200)	—	
Eosinophils	1 % (100)	—	—
Transitionals	4 % (400)	—	3 % (1,860)

In the last cell count there was also about 5 per cent. of myelocytes, but the predominating cell was a large mononuclear with non-granular cytoplasm, which did not show any granules with the "oxidase" stain. This was called a lymphocyte in earlier films, but was possibly a "pre-myelocyte."

CASE 2.—A boy, aged 2 years and 1 month, was admitted to the Hospital for Sick Children on March 27th, 1929. He was the only child of healthy parents, and was quite well until January, 1929, when he is stated to have had "ulcerated tonsils," and he was ill for three weeks. About a fortnight after this he was suddenly seized with pains in his joints. These pains were somewhat fleeting in character, and affected his hips, knees, wrists, ankles, and especially the finger-joints on the left hand. He improved for a week, and then relapsed, and a fortnight after the beginning of his arthritic pains the glands in his neck became swollen. Feverishness was stated to have been present throughout the illness.

On admission he was a well-nourished, pale child, very fretful, and apparently in pain. The glands on both sides of the neck were obviously enlarged, discrete, and rather tender, while the glands in the axilla and groin were easily palpable. There was some indefinite swelling of the wrists, the left being slightly tender. Radiographic examination of the long bones showed in positions corresponding to the situations of his pain somewhat irregular rarefied areas in the shafts close to the epiphyses. The tonsils were enlarged and red, but without an exudate. The heart was not enlarged, but there was a systolic murmur at the apex with abrupt heart sounds. Over the head were several hard swellings about the size of a pea, not attached to bone, and movable with the scalp. The liver was enlarged to about two fingers-breadth below the costal margin, the spleen was not palpable, and there were no enlarged glands palpable in the abdomen. The respiratory and nervous system were normal, and the urine contained no abnormality. The temperature was raised on admission (100° F.), and the pulse-rate was 140 per minute, the pulse being soft and easily compressible.

Progress.—At first there was some improvement, and the glands became a little smaller. The nodules on the head varied from time to time, occasionally almost disappearing. A right-sided ear discharge developed, and early in May, 1929, the glands in the neck all became larger, while glands over both parotids also enlarged. Some œdema, redness, and tenderness over the right side of the lower jaw developed in association with a septic tooth socket, and shortly after this on May 18th the spleen became palpable. From this time onwards the progress was downhill. The temperature became higher (102°–103° F.) and swinging, a brassy cough developed, and a purpuric rash appeared over the right side of the trunk and legs. The swellings on the head became at first rather larger, but towards the end almost completely disappeared. The heart developed a "bruit de galop," and death occurred on June 14th. The Wassermann reaction was negative.

The blood counts throughout the illness also were somewhat puzzling, and were complicated by the various septic processes which occurred (otitis media, septic tooth). The counts are summarised in Table II.

TABLE II.

Date in 1929 ..	March 28th.	April 16th.	May 3rd.	June 13th.
	Per c.mm.	Per c.mm.	Per c.mm.	Per c.mm.
Red corpuscles ..	4,950,000	2,900,000	3,375,000	806,000
Hæmoglobin ..	60 %	50 %	50 %	Less than 20 %
	Per c.mm.	Per c.mm.	Per c.mm.	Per c.mm.
White corpuscles ..	24,000	11,400	19,000	1,750
Polymorphs ..	50 % (12,000)	28 % (3,192)	54 % (10,260)	—
Small lymphocytes	6 % (1,440)	—	8 % (1,520)	—
Large lymphocytes	28 % (6,580)	46 % (5,244)	24 % (4,560)	—
Mononuclears ..	14 % (3,290)	24 % (2,736)	13 % (2,470)	—
Transitionals ..	2 % (480)	2 % (228)	1 % (190)	—

The large lymphocytes and mononuclears were very similar to the abnormal cells present in Case 1, being non-granular single nucleated cells, giving a negative "oxidase" reaction.

Post-mortem examination was performed 12 hours after death by Dr. C. Kellett.

The scalp showed only a few indefinite areas of thickening; no definite nodules could be found. The skull, brain, and meninges were normal. The thymus was small, the thyroid normal, but all the glands in the neck were distinctly enlarged, as also the lymphoid tissue in the nasopharynx. The glands on section were white and hard, and showed no caseation. The lungs and pleuræ were normal, and there was no enlargement of the mediastinal glands. The heart was slightly enlarged with pale and easily friable muscle. In the abdominal cavity there were numerous enlarged lymphatic glands, especially in the pre-aortic region in the neighbourhood of the pancreas. The liver was pale, somewhat enlarged and firm, and the spleen was moderately enlarged, weighing 60 g., and showed some hyperplasia of the lymphoid areas. There were no naked-eye deposits of any abnormal material in either liver or spleen. The kidneys were pale, and suprarenals somewhat shrunken. The intestines showed hyperplasia of the lymphoid elements, both in small and large bowel. The left femur showed very pale bone-marrow throughout, but there were no definite infiltrations of bone found in the portions examined.

Histological examination showed some evidence of bronchopneumonia in the lungs, and cloudy swelling with fatty

degeneration in the kidneys. The liver showed fatty degeneration of the liver cells, and the portal tracts were infiltrated in an irregular manner with small round mononuclear cells with poorly stained cytoplasm. The spleen and lymphatic glands showed definite changes which were similar in both series of sections. These consisted of (*a*) definite increase in the fibrous tissue elements; (*b*) hyperplasia of all the cells with a slight predominance of the endothelial cells; (*c*) slight increase in eosinophils; and (*d*) no evidence of any tubercle formation or of abnormal malignant cells. Some of the endothelial cells were larger than normal, but no definite multinucleated cells were found. On the whole the sections seemed to conform to the "lymphadenoma" type of glandular hyperplasia.

Discussion.

The early age is a remarkable feature of these cases, and this, combined with the pains in the joints and limbs at an age too old for scurvy and, in general terms, too young for rheumatism, is at once perplexing and warns the clinician of difficulties ahead. The deposits in the scalp in these two cases appeared to us very remarkable. They were especially numerous on the vault of the cranium and not in the occipital region; but except for this they were suggestive of unusually large and numerous rheumatic nodules, such as may occur in occasional examples of virulent rheumatism. Further, they varied in size, diminishing in the second case so obviously that everyone was struck by such an occurrence when the disease itself was clearly advancing. There were no nodules on the elbows and knees or elsewhere, except in the first case those lying below either eyebrow. The rheumatic pains in the joints and muscles were striking and in the second case puffy swellings around the wrist-joints were observed in the hospital. In the first case the arthritic symptoms had disappeared before he came under our care, but the history was sufficiently definite to have made the diagnosis of acute rheumatism a probable one to the earlier observers. The blood picture in the first case gradually developed along the lines of an acute leukæmia, and when this child was taken from the hospital the pigeon-hole into which the case was placed was that of leukæmia. In the second case the nearest pigeon-hole appeared to be lymphadenoma.

These two cases appear to us to illustrate a view which we believe to be a valuable one in the study of the blood diseases in young children, which is to throw over boldly any classification based upon classical leukæmia and lymphadenoma, and start anew on the assumption that we are dealing with infective processes to which there is a reaction by the tissues, and by the blood, in particular, of an unusual kind. We recognise that in suppurative infections, such, for example, as empyema, the usual reaction is an increase in the polymorphonuclear leucocytes, that in glandular fever there is a mononucleosis, that in mumps there is a lymphocytosis, and in typhoid fever a leucopenia. It seems a reasonable hypothesis to suppose that the leukæmic and aplastic conditions met with in childhood may represent some disordered response to infection or some curious type of infection which calls forth these unusual results. In both these cases, and in many of the cases of leukæmia in childhood, we find suspicious evidence of previous infection such, for example, as tonsillitis or bronchitis.

It has already been stated that in attempting to search the literature for other similar cases we have been hampered by the problem of under what heading to look. There was a case, however, under the care of Dr. Hugh Thursfield some years ago, and shown at the Section for the Study of Disease in Children of the Royal Society of Medicine in 1925,[1] which was in the memory of one of us as being very similar to the two cases under discussion.

Dr. Thursfield's case was a boy of 4½ years, who had enjoyed good health until five months before admission to hospital, when the glands in the neck and axillæ enlarged. He had carious nodular swellings in the scalp which, according to the mother, "came and went," and certainly varied in size while he was under observation. His blood count showed a secondary anæmia, while the white cells numbered 7800 per c.mm., of which 96·5 per cent. were lymphocytic. He had severe epistaxis on several occasions, developed a purpuric rash, and had retinal hæmorrhages. His right ear began to discharge freely while he was in hospital, and a septic condition of his lower jaw developed. His spleen was only just palpable, and after making an apparent recovery he became worse again, and died with great enlargement of the spleen. At a post-mortem examination large, pale lymphatic glands were found all over the body, and on section the liver showed a patchy infiltration, with small lymphocytes along the portal tracts, while the spleen was greatly congested and infiltrated with similar small round cells.

This case was presented by Dr. Thursfield as either an unusual type of lymphocytic leukæmia or an abnormal lymphocytic response to some infection, and one subsequent speaker suggested the term "leukæmic lymphadenosis." Whatever label be applied, the case shows remarkable similarity to our two cases: glandular enlargement, sepsis of ear and jaw, nodules in the scalp, a mononuclear type of response in the blood without leucocytosis, and a fatal termination.

The hypothesis we put forward, which this third case would seem to support, may not be sound, but it would lead to a study of the reactions of the blood to infections in childhood unhampered by the conception of certain primary blood diseases. It is well known that the present pigeon-holes set aside do not serve to find a place for many of the unusual blood pictures we find among the anæmias and leukæmias of childhood, and these unusual blood pictures may eventually be found to mark stages in a faulty reaction to infective processes, the final picture being in some cases the classical anæmias and leukæmias which we all recognise.

Summary.

In conclusion, we should like to summarise the salient features of the cases we have described, so that other observers may be able to recognise the condition—subacute onset, glandular enlargement, arthritic pains and swellings, nodules in the scalp, fever, mononuclear response in the blood, slight enlargement of the spleen, serious course and severe nature of the malady, with terminal hæmorrhages in various situations.

[1] Proc. Roy. Soc. Med., 1925, xix., 26 (Section Proceedings, p. 4).

TUMOUR IMMUNITY.

TREATMENT BY AUTO-VACCINATION OF IMPLANTED MOUSE CARCINOMA (M. 63.)

BY THOMAS LUMSDEN, M.D. ABERD.

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SOME 18 months ago it was shown in THE LANCET [1] that sarcomata (Jensen's) growing in the flank of rats could be caused to regress by injecting 1 per cent. formalin into them, and that the rats so treated were thereafter immune to reinoculation with this tumour in all parts of their bodies. This procedure was named vaccine treatment, because it was held that at some stage of the destruction of tumour cells by formaldehyde, a soluble antigen was produced and absorbed into the circulation in sufficient quantity to arouse immunity.

The justness of this view was evident to those who observed systematically the animals while under treatment, but was less apparent to cancer research workers who had no actual experience of the treatment. This was not unnatural, since Jensen's rat sarcoma is a tumour which induces some concomitant immunity, and hence even rats from which it has been simply excised exhibit thereafter a considerable though lesser degree of resistance to reinoculation.

In order to demonstrate unexceptionably the mechanism involved, it was necessary to show that

[1] THE LANCET, 1927, ii., 1283.

comparable results could be obtained in the case of a tumour which, it was universally admitted, did not evoke effective concomitant immunity and which could therefore always be successfully reinoculated into an animal from which it had been excised. Such a tumour is the mouse mammary carcinoma, M. 63 of the Imperial Cancer Research Laboratory. Russell [2] stated that this is "a strain giving progressively growing tumours in practically every animal inoculated," and that "its power of inducing resistance is nil." With these dicta all other investigators have agreed. The results obtained by vaccine treatment of this tumour are detailed below.

Experiments.

A single fragment of very active tumour material (M. 63), weighing from 0·005 to 0·01 g., is inoculated into the right flank of each of a series of mice. The mice are examined after a week, and those (generally about 90 per cent.) in which a progressively growing tumour has resulted are separated for treatment. This is begun usually on the eighth to tenth day after inoculation, when the tumour has attained a diameter of 4 to 5 mm—i.e., a size comparable (allowing for the difference in body-weight) to a tumour the size of an orange in man. By means of a very fine hypodermic needle a solution of formalin (1 per cent. in *normal saline*, not distilled water) is injected slowly into the centre of the tumour so as to distend it as much as possible without bursting its capsule, some of the solution is then injected around and deep to the tumour. About 0·1 to 0·25 c.cm. of the formalin solution is inoculated altogether. This procedure is repeated daily until the tumour is evidently disappearing. The decision as to whether treatment should be continued or stopped and the appropriate dose for injection is always difficult and only experience makes the best results attainable. The thing to aim at is gradual regression of the tumour, without so much damage to the surrounding normal tissues and the skin over it as to cause ulceration. In an animal so small and fragile as a mouse this entails delicate and sensitive handling.

	T_1 I_3	T_1 I_4	T_1 I_5	T_1 I_2	T_1 I_1	T_2 I_3	T_2 I_2	T_2 I_1	T_2 $I?$	T_3 I_3	T_3 I_1	T_3 $I?$	T_2 F	T_3 F
1	W												W	
2	W												B	
3		Br											F	
4		W											G	
5		Br											GW	
6		F											GW	
7		W												W
8		W												W
9		Br												BW
10			Br											B
11			W											BW
12			W											F
13			BW											B
14				Br										BW
15					Br									W
16						Br								Br
17							B							F
18							W							BW
19							W							Br
20							Br							W
21							W							GW
22								W						W
23								W						BW
24									W					FW
25									GW					W
26									BY					
27										Br				
28										B				
29											F			
30											BW			

T_1, T_2, T_3 represent the number of tumours which had to be treated before immunity (I) or failure (F) resulted. I_3, I_4, I_5, &c. = Immunity evidenced by 5, 4, or 3 consecutive negative tests. The letters W = white, B = black, Br = brown, G = grey, F = fawn, BW = black and white, &c., indicate the colour of each mouse.

As soon as the tumour has regressed and any inflammatory reaction which was present has disappeared, a second—i.e., first test—inoculation of active tumour material is made into the left flank of each treated mouse, controls being inoculated with similar material and dose in *every* instance. In a proportion (about half) of the treated and tested mice no tumour appears, but even so the mice are not judged to be certainly immune until they have been tested three or four times with inocula of increasing amount (0·02 to 0·05 gr.).

If the first test inoculation on the left side gives rise to a tumour it frequently indicates that the tumour originally treated had not, in reality, been eradicated and recurrence on the right side is apt to take place if the test inoculation on the left side is made too early. When this happens both the left flank tumour and the recurrence on the right side are treated with formalin, and only after both have entirely disappeared is the mouse retested.

In a few mice it has been necessary to treat more than two tumours in this way. The detailed results are as shown in the table.

It will be seen that the experiment concerned 55 tumour-bearing mice. Of these 30 were ultimately cured, while in 25 mice treatment failed, and these 25 mice, though the course of the disease was much delayed, ultimately died from cancer. Of the 30 cured mice, 26 were tested for immunity; of these, 15 were found to be immune after treatment of one tumour only, 8 after treatment of two tumours, and 3 after treatment of three tumours. The remaining four cured mice died of intercurrent diseases (such as diarrhœa and pneumonia) before the result of the test inoculation was evident. Of the 26 cured and immune mice:

2	were tested negatively	on	5	consecutive	occasions.
7	" "	"	4	"	"
5	" "	"	3	"	"
8	" "	"	2	"	"
4	" "	"	once.		

The average number of consecutive negative tests in the 26 immune mice was thus 2·8 per mouse.

While these results are inferior to those obtainable when treating rat tumours [3] they are considered sufficiently striking to demonstrate that the conclusions arrived at previously were sound. Although others have, in rare instances, observed spontaneous regression in the case of tumours of the strain here dealt with (M.63), it is clear from the sentence quoted above that this was not Russell's experience, and in my laboratory spontaneous regression has never been noticed in a series of over 7000 implantations. To have caused regression followed by immunity in 50 per cent. of the treated animals is therefore a significant result, especially since mice are so small and fragile as to make successful treatment of this sort difficult for purely mechanical reasons.

Remarks.

It will be appreciated that in this experiment all the mice were proved to be *not naturally immune*, since they were chosen for treatment only after a progressively growing tumour had resulted from implantation of a fragment of M.63. Any confusion from this source is thus entirely excluded. The virulence of the test material was in *every* instance demonstrated by inoculating it into an equal number of normal mice. In these controls the implantations grew progressively in 80 per cent. to 100 per cent. of the different batches of normal animals. The degree of immunity evoked and the percentage of cures obtained depends on the skill and judgment exhibited by the experimenter, yet it is believed that even an investigator with but little experience of the method will obtain results good enough to convince himself as to the principles concerned, which is, after all, the most important point.

[2] Fifth Sci. Rep. Imp. Canc. Res. Fund, 1912, p. 5.

[3] THE LANCET, 1927, ii., 1283.

It may be well to recapitulate here some of the details of technique which should be meticulously followed:

1. The original inoculations should consist of a single fragment of very active material about 0·01 g. in weight, and the injecting needle or cannula should be inserted as far as possible from the inguinal glands, since if these get infected cure is more difficult to effect.

2. After sucking the fragment into the injecting cannula the point of the latter should be washed in saline.

3. When treating the tumours inject through a very fine hypodermic needle about 0·1 to 0·25 c.cm. of 1 per cent. formalin in saline very slowly into the growth, trying to distend it without bursting its capsule. Some of the formalin should, before withdrawing the needle, be injected around the tumour.

4. Begin treatment when the tumour has a diameter of 0·4 to 0·6 cm. and continue the injections daily, as long as any definite circumscribed growth can be felt, through the œdematous swelling caused by the injections.

5. Do not test for immunity until it seems certain that the treated tumour has completely disappeared, otherwise the test inoculation is apt to grow and the original tumour to recur. If this happens, repeat the treatment.

6. Keep a careful record of the dates on which each individual mouse has received a formalin injection, and the dates of each test and retest inoculation.

7. Do not inject formalin into the inguinal gland unless it is progressively enlarging or the skin over it looks purplish. It often gets enlarged as the result of simple inflammation and regains its normal size when treatment of the tumour is finished.

A high degree of immunity as indicated by failure of the first and all subsequent test inoculations is most likely to occur when the original tumour was of considerable size—i.e., in the neighbourhood of a quarter to a half gramme in weight—and where its regression has been achieved without ulceration of the skin or much destruction of normal tissue. Since tumours of a variety (M.63) which does not tend to regress naturally are caused to disappear completely, and the animals in which this has been effected are thereafter immune to recurrence or reinoculation, there need be no hesitation in using the word "cure" in relation to the results of auto-vaccination of this sort in the case of the implanted cancers of rats and mice. With the slower growing Twort's carcinoma results equivalent to the above are much more easily attained.[4]

Taken along with the results previously reported the above findings indicate that by means of auto-vaccination we are either (1) aiding by our intervention some natural protective mechanism which every animal possesses, or (2) evoking some new curative process. The former appears to the writer the more probable of these alternatives. A general review of the pertinent observations suggests that all animals exhibit in varying degree resistance against the growth of any variety of tumour cells inoculated into them. If this be so, any sharp classification of tumours into two distinct groups—viz., those which give rise to concomitant immunity and those which do not—is misleading.

The facts that implantations of heterologous tumours never grow progressively, that homologous tumour implantations sometimes fail to grow and sometimes spontaneously regress, and that in rats tretted by auto-vaccinatinn autoplasties of spontaneous tumours are not invariably successful, all lend support to this view. The rare but well-authenticated cases of spontaneous recovery which have been observed in man give justification for the hope that even in the case of human cancer the body resists the invasion of its tissues by malignant cells, by means of a mechanism comparable to that by which it resists the growth of implanted tumours—a mechanism which it may, in like manner, be possible to assist to the extent of rendering it effective in a large proportion of cases.

In the long series of experiments previously reported [5] the aim has been to discover the mechanism of the spontaneous control or cure of cancer, and the conclusions arrived at are that natural recovery is, in the case of implanted tumours, characterised by the production of anti-malignant-cell bodies in the serum of the affected animal, along with the elaboration by extravasated leucocytes of a lytic substance capable of destroying (even homologous) cancer cells.

The facts observed suggest that the agency which induces this process of regression is the absorption from the tumour area of some product of dying tumour cells which provides the necessary antigenic factor. Evidence in favour of this view has been published in previous communications.[6]

In the above schema the facts herein reported are of interest as indicating that the methods which evoke increase of immunity against a tumour which gives rise to a high degree of comcomitant immunity—e.g., J.R.S.—are applicable to a tumour of which it has been agreed that, in the words of Russell, "its power of inducing resistence is nil"—viz., the mouse carcinoma, M.63 of Imperial Cancer Research.

One further step has to be taken in lower animals before human tumours can be hopefully treated along these lines. It is necessary to discover whether vaccine or serum treatment can be effectively applied to spontaneous mouse and rat tumours. The author has now bred some 700 mice from a strain kindly sent him by Dr. Burton T. Simpson, of Buffalo, U.S.A. Seventy per cent. of the females of this strain are, in America, found to develop spontaneous mammary cancer when they reach the age of 5–20 months. If a similar proportion of these mice develop tumours in this country (none has done so yet), the great initial difficulty of obtaining an adequate amount of experimental material should be obviated. It seems certain that it will be especially difficult to evoke immunity against spontaneous and therefore autologous tumours, but it may nevertheless be found possible to overcome this final difficulty. In any case the attempt must and will be made as soon as sufficient material is available.

Summary and Conclusions.

1. In 30 out of 55 mice in which mammary cancer (M.63) was growing progressively, the tumours were caused to regress by auto-vaccine treatment (injection of 1 per cent. formalin saline into the growth) and the mice so cured showed a high degree of immunity against subsequent implantations of the tumour.

2. The facts reported indicate that all animals resist the invasion of their tissues by implanted (and possibly by spontaneous) tumour cells, through a mechanism which can be strengthened by auto-vaccination. In the case of certain animals and tumours this natural mechanism is without further stimulation occasionally sufficient to prevent progressive tumour growth—e.g., Jensen's sarcoma in rats. In other instances the unaided natural resistance is inadequate—e.g., M.63 in mice. It is misleading to think of implantable tumours as falling into two discrete groups—viz., one group in which concomitant immunity is evoked and another in which no such immunity appears. No hard-and-fast line can be drawn between the one group and the other. Any differences seen, appear to be not in kind but only in degree.

The author gratefully thanks Sir Charles Martin, F.R.S., for helpful criticism and for facilities at the Lister Institute, the British Empire Cancer Campaign for its grant, and Miss A. C. Kohn Speyer, M.A., for assistance in keeping records of the experiments and in other ways.

[4] Cancer Conference, London, 1928, p. 216.
[5] THE LANCET, 1927, i., 116.
[6] (*a*) THE LANCET, 1927, ii., 1283; (*b*) Cancer Conference, London, 1928, p. 216.

THE SOUTHEND HOSPITALS.—New mental wards of Rochford Poor-law Hospital have recently been opened. The institution will be taken over by the Southend Town Council when the guardians are disestablished, and cases will then be received from the area outside Southend. The Rochford Board of Guardians have refused to renew their subscription of £125 to the Southend Victoria Hospital unless they are represented on the governing body.

Clinical and Laboratory Notes.

A CASE OF SEBACEOUS CYST UNDERGOING MALIGNANT CHANGES.

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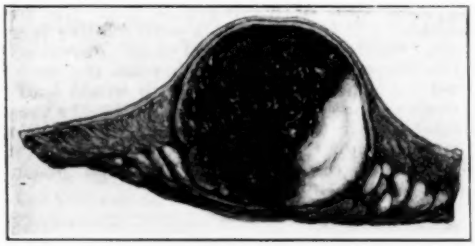
THE danger of neglecting to act upon medical advice with regard to the treatment of a simple tumour has been well exemplified in a case which recently came under our observation.

Colonel A., aged 75, consulted one of us about four years ago on account of a swelling on the back just below the angle of the right scapula. He had had no pain, and his attention had been drawn to its presence by the attendant at a Turkish bath. On examination the tumour proved to be a simple sebaceous cyst. The patient was told that its removal was an easy matter and entailed very little discomfort, but nothing more was seen of him until December, 1928, when he once more asked for an interview. His story was that he had enjoyed good health since his last visit, and that he was only seeking advice because the Turkish bath attendant had informed him that something seemed to be going wrong with the lump on his back. Investigation revealed the fact that a hæmorrhage had occurred into the cyst which was the size of a walnut, and that there was considerable infiltration of the subcutaneous tissues. There was no evidence of inflammation.

It was represented to the patient that excision of the tumour was now urgently required, and permission was obtained to operate under local anæsthesia. A 1 per cent. solution of novocaine was injected beneath the skin and into the cellular tissue around the cyst, and by an elliptical

FIG. 1.



A drawing of the tumour as it appears on vertical section.

incision the whole mass down to the muscles of the back was removed. The convalescence calls for no comment.

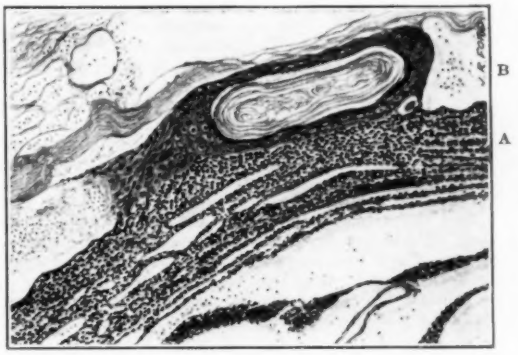
The interest of this case lies in the pathological changes which apparently occurred during the course of the last four years.

Sebaceous cysts commonly become inflamed and suppurate. They may even fungate, producing a foul offensive mass which has been mistaken clinically for a cancer. Rarely an encapsuled tumour somewhat resembling a sebaceous cyst has been observed growing from the scalp. This is filled by a folded ingrowth of squamous epithelium, and has been given the name of "benign epithelioma." The case which we record is clinically a sebaceous cyst, but on histological examination proves to be a basal cell carcinoma. Most of the red mass (which appears dark in Fig. 1) consists of fairly recent blood clot which is beginning to organise. The white mass in the bottom right hand segment consists of structureless homogeneous material.

The capsule is formed of rather cellular fibrous tissue, and externally forms a definite boundary everywhere except at the most prominent part of the tumour where it blends with the skin epithelium. Internally the capsule is less defined and at places shows island of fairly normal squamous epithelium forming horny pearls. Lying beneath the capsule and tending to blend with it is a mass of cells of basal cell type arranged in anastomosing strands to produce a reticular appearance, some of the spaces of which are occupied by a loose connective tissue with very thin-walled blood-vessels, some by only a thin-walled blood sinus, and others by homogeneous acellular material.

At certain places the basal cells can be seen to be originating from one of the islands of squamous epithelium mentioned above; this is well shown in Fig. 2. At other parts these

FIG. 2.



Microscopic section showing outgrowth of basal cells (A) from an island of squamous epithelium (B).

cells are arranged in a manner recalling the structure of a sweat gland. This tissue lines the whole of the internal surface of the capsule, except opposite the white mass of structureless material. It varies in thickness, and in one place forms a band which can be recognised microscopically as a mass somewhat lighter than the blood clot.

The presence of the epithelial islands in the position described bears out the clinical finding that the tumour was originally a sebaceous cyst; the origin and type of cells in the new growth are those of a basal cell carcinoma (rodent ulcer). The somewhat unusual arrangement is what might be expected from the fact that the tumour has grown into a non-resisting structureless mass and has had to form its own stroma and blood-vessels. To this fact also the extensive hæmorrhage may be attributed.

AN OUTBREAK OF SCARLET FEVER AMONGST ADULTS.

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RESIDENT MEDICAL SUPERINTENDENT, BOROUGH HOSPITAL, CROYDON.

DURING the first six months of 1929 322 cases of scarlet fever were admitted to the Borough Hospital, Croydon, and 74 (23 per cent.) of these were in-patients between the ages of 15 and 50 years. In the corresponding period of 1928 there were 259 scarlet fever cases, of which only 34 (13 per cent.) were in this age-group. Most of the scarlet fever admissions in 1929 were in March and May, whereas in 1928 the number was greatest in February, after which there was a steady fall. The greatest incidence of the disease was in the age-group 15 to 20 years, as shown in the table.

Ages.	M.	F.	Ages.	M.	F.
15–20 years	12	13	40–45 years	1	1
20–25 ,,	6	13	45–50 ,,	—	2
25–30 ,,	7	4		—	—
30–35 ,,	3	4			
35–40 ,,	2	6	Total	31	43

M. = males. F. = females.

Many of the 74 cases were of the septic type with intense rashes, marked injection of fauces, and dirty

tonsils, glandular enlargement, and high fever. The complications were as follows: adenitis, 6; albuminuria, 2; rheumatism, 2; rhinorrhœa, 5; otorrhœa, 1; secondary sore-throat, 5. There were two relapses on the 17th and 24th days.

Of the cases of septic type 25 were treated with scarlet fever streptococcal serum, of which they received 10·0 c.cm. intramuscularly on admission—i.e., between second and fourth day of disease. Serum rashes with slight rise of temperature and joint pains, either scarlatiniform, urticarial or papular, were noted in 12 cases, the rash appearing within 7–14 days of injection and usually lasting 24–36 hours, but there were no cases of serum sickness. The giving of serum did not seem to bring down the temperature more rapidly, but no relapses occurred in the serum-treated cases. The average stay in hospital for the serum cases was 30 days, whereas it was 31 days for the others.

The interesting feature of this outbreak is that 23 per cent. of the cases occurred after the third quinquennium of life, whereas the disease is usually commonest between the ages of 2 and 6, two-thirds of the cases occurring, as a rule, in the first and second quinquenniums. According to Kerr, cases are few in number after the age of 15 years. The giving of scarlet fever streptococcal serum did not seem to affect the incidence of complications or the length of stay in hospital to any great extent. All but one of the serum cases which developed complications were females.

I wish to thank Dr. Oscar Holden, medical officer for Croydon, for permission to publish this note.

A CASE OF *BRUCELLA ABORTUS* INFECTION IN MAN.

BY H. E. BLOXSOME, M.R.C.S. ENG.,
SURGEON TO THE FAIRFORD COTTAGE HOSPITAL.

With a Pathological Report by

E. N. DAVEY, M.D. N.U.I.,
PATHOLOGIST TO GLOUCESTER ROYAL INFIRMARY.

A DISPENSING chemist, aged 50, was attacked at the end of last March by what I called influenza.

The onset was sudden, with chilliness and sweating, and some headache and fleeting pains. The temperature was moderate, and I thought he would be well in a week; but at the end of that time his temperature was still 101° F. at night, and his pulse-rate kept steadily high (120). He sweated a great deal, but had no aches or pains, and on examination I could find no physical signs. There was no previous medical history of note, except occasional febrile attacks in winter.

The patient was thin, and had a slight cough, so I asked Dr. W. A. Dickson, the Gloucestershire tuberculosis consultant, to see him, but he could not find any physical signs in the chest, abdomen, or central nervous system. The urine was free from albumin and sugar. The bowels acted normally. The features of the illness were the drenching sweats and the undulant character of the fever, and the rapid and weak pulse. He had no joint pains, and no enlargement of spleen or liver. After about a fortnight of this pyrexia I sent a specimen of his blood to Dr. Davey, who reported no signs of typhoid or the paratyphoids. He found, however, that the serum agglutinated the *Brucella abortus*—a strain of which he was working with at the time. The patient lived a very sedentary life, and seldom went out except on his motor-cycle, so that he had not come into contact with any animals; he drank very little milk, and had only once been out of his market town in a year, for half a day. No one else in the town had shown any signs of a mysterious disease. His brother had rather a prolonged influenza, which we afterwards thought might have been this infection, but his blood did not clump the bacilli.

The drug treatment used was urotropine grs. x t.d.s. Quinine in 5-grain doses had no effect on the temperature. After a course of urotropine the patient himself suggested salol, and from the moment it was employed the fever abated—post hoc probably, but worth remembering in a future case. The febrile period was about three months, and the temperature was normal by June 25th. On August 21st, however, the patient had to be readmitted to the Fairford Cottage Hospital with a recrudescence of a milder type. On this occasion his pyrexia lasted only ten days. He has now (Oct. 12th) resumed work.

There is always a great deal of contagious abortion in this neighbourhood, the veterinary surgeons tell me; but there is no clue to show how this patient picked up the organism.

Pathological Report by Dr. DAVEY.

Owing to the prevalence of contagious abortion amongst cattle in this area, we have been making it a practice to examine all sera submitted for agglutination reaction for typhoid fever, against the *Br. abortus* Bang, Oxford standard cultures.

The serum of this patient was submitted on May 7th. It gave a negative reaction with *B. typhosus* and *B. paratyphosus* A and B, but was found to agglutinate *Br. abortus* in dilutions of 1 : 25 to 1 : 250. When the agglutination was carried to its highest titre it agglutinated in as high a dilution as 1 in 5000 after four and a half hours' incubation. It also agglutinated *Br. melitensis* in dilutions of 1 : 25 to 1 : 500.

We saw the case in consultation on May 13th, and beyond the tachycardia and high temperature there were no objective signs present. The blood count was: red cells, 3,000,000 per c.mm.; white cells, 5600 per c.mm. Differential white cell count: polymorphonuclears, 42 per cent.; small lymphocytes, 45 per cent.; hyalines, 8 per cent.; and myelocytes, 5 per cent. Blood cultures in Douglas's broth and trypsin broth and on serum and blood-agar were sterile after six days' incubation; both aerobically and under partial CO_2 pressure. Urine cultures were sterile.

On July 12th, after the temperature had subsided, a further agglutination reaction was performed, the titre then being *Br. abortus* 1 : 25 to 1 : 2500, and *Br. melitensis* 1 : 25 to 1 : 500. The patient was again seen on August 19th, when he was convalescent. His only symptom was tachycardia, and his blood picture was: red cells, 4,500,000 per c.mm.; white cells, 4600 per c.mm.; hæmoglobin, 60 per cent.; colour-index, 0·66. Differential count: polymorphonuclears, 47 per cent.; small lymphocytes, 30 per cent.; hyalines, 18 per cent.; myelocytes, 5 per cent.

The interesting points in connexion with this case are: (1) The very high agglutination titre, the fact that it was higher for *Br. abortus* than *Br. melitensis* being diagnostic of an infection with the former organism. (2) The leucopenia with relative lymphocytosis, which persisted well into convalescence. (3) The absence of any signs beyond the undulant character of the temperature which would lead to a diagnosis of the condition other than by the presence of agglutinins in the patient's serum. It is becoming increasingly important in this country to examine sera in cases of pyrexia of unknown origin for *Br. abortus* agglutinins.

DONATIONS AND BEQUESTS.—Mr. Henry Dakin, of Millers Dale, Buxton, left one-third of his estate amounting to over £4000 upon trust for his brother for life with remainder to the Derbyshire Royal Infirmary, part of this bequest to be used to endow a Henry Dakin bed.—Miss Ellen Constance McKee, of Bentinck Mansions, Bentinck-street, Marylebone, left £500 each to the Elizabeth Garrett Anderson Hospital, Euston-road, and the South London Hospital for Women, Clapham Common; £250 to the London (Royal Free Hospital) School of Medicine for Women; and £100 each to the National Education Association, Caxton House, and the Association for Moral and Social Hygiene, Great Smith-street, Westminster.—Miss Evelyn Winifred Riley, of Harrington-gardens, South Kensington, left estate of the value of £178,189, and made many bequests to charities, including £1000 each to the Royal Surgical Aid Society, the United Kingdom Beneficent Association, and the National Society for the Prevention of Cruelty to Children; £500 each to the West London Hospital, the Hospital for Women, Soho-square, the Middlesex Hospital, and the National Institute for the Blind, Great Portland-street; and £100 to the Society for the Prevention of Cruelty to Animals. She left £14,500 in trust to pay certain annuities and subject to such annuities between the Surgical Aid Society, the United Kingdom Beneficent Association, the Society for the Prevention of Cruelty to Children, the West London Hospital, the Hospital for Women, the Middlesex Hospital, and the National Institute for the Blind.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF PATHOLOGY.

ON Oct. 15th Prof. A. E. BOYCOTT, F.R.S., delivered a presidential address to this Section on

THE BLOOD AS A TISSUE.

Besides being a carrier of food, excreta, and hormones, the blood, he said, is a tissue. As such it has a life of its own, malformations (e.g., acholuric jaundice) and tumours (e.g., leukæmia, splenomegalic polycythæmia), and can be studied for itself. There being no name for the total quantity of red corpuscles with the marrow cells from which they come, he suggested the word "erythron" as convenient. Hypertrophy of the erythron is caused by relative lack of oxygen whether this is due to high altitudes (anoxic type of Barcroft) or slowness of circulation (stagnant type), though in many cases of heart disease the associated increase in viscosity would be harmful and the reaction does not occur. Similar active growth (regeneration) in anæmia is also due to anoxæmia (anæmic type). Atrophy of the erythron is caused by relative excess of oxygen as in compressed air, persons returning from high altitudes to sea-level, and after transfusion. Hypertrophy and atrophy are both conditioned by the needs of the animal; similar conditioned responses (atrophy and regeneration) in the liver and kidney in mammals, in the claws of a prawn, and in the tentacles of a worm were considered. In all cases the result has the appearance of a purposive action, and it was urged that a frank acceptance of a teleological outlook made pathology more intelligible and formed a sound guide in investigation. The normal quantity of hæmoglobin and its concentration in the blood is a compromise between the desirability of having plenty of oxygen and the disadvantage of having blood which is too viscous, the best balance depending on the rate of the circulation.

SECTION OF NEUROLOGY.

AT a meeting of this Section held on Oct. 10th, the retiring President, Mr. DONALD ARMOUR, introduced Dr. GORDON HOLMES, who delivered his presidential address on

DISSOCIATION OF THE OCULAR MOVEMENTS.

It was often assumed, he said, that the almost ceaseless movements of the eyes were purely voluntary; indeed, clinical pathology and physiology had shown that the majority occurred without the intervention of the cells in the higher regions of the cortex. These movements were, however, profoundly influenced by labyrinthine activity, other sensory impressions, proprioceptive stimuli from the muscles of the neck, and probably also by the basal ganglia. A very large number of ocular palsies were theoretically possible. Dr. Gordon Holmes said that some of these had been recognised and these would form the subject of his address, together with observations on five patients who had been under his care.

The essential feature of a lesion of the pons in the neighbourhood of the sixth nerve nucleus was the loss of conjugate movements towards the paralysed side; these could not be obtained voluntarily, reflexly, or by any other means. The result was like that of an interruption of the final common path, but that the internal rectus contracted normally on convergence. The paralysis was therefore not of muscles but of movement. The possibility of loss of associated movements of the eyes, in spite of the integrity of muscles, nerves, and nuclei, had been described in 1883, and the first example had been recorded in 1895 (Oppenheim's case). Many cases manifesting very varied clinical signs had been recorded since then.

A typical case had first been seen by Dr. Gordon Holmes three months after the acute onset of the trouble. At that time the vertical and convergent movements were quite normal, but there was absolutely no deviation to the right. The eyes moved very slightly to the left of the midline, but the movement was incomplete, jerky, irregular, and required a great effort; it showed what Hughlings Jackson had called "punctuation of movement." The patient could, however, follow a moving object if it were not moved too rapidly or jerkily. If he fixed a stationary object and rotated his head his eyes remained fixed on the object; they therefore deviated fully and regularly—i.e., they responded normally to proprioceptive impulses from the neck muscles. When the eyes were fully deviated to the right he could not move them back to the centre; they only returned when the object was brought back or the head was rotated to the left. Later on he learned to bring his eyes back by blinking repeatedly and firmly closing the lids. In the street he relied on head movements, and if any object excited his attention just as he wanted to turn the eye would remain fixed and would not turn with the head, which was often very awkward. Reading was slow and awkward; he had to pick out each letter in succession. The end of each line offered great difficulty; almost the only therapeutic success obtained was in teaching him to fix his eyes on his finger at the end of each line, and move it back to the beginning of the next. Irrigation of the left ear with cold water, which normally causes vertigo and nystagmus with a quick component to the right and a slow one to the left, brought about no change in this patient, even after three minutes, and when 600 c.cm. of water had been used, but his outstretched arms deviated normally to the left. However, as soon as the irrigation ceased his eyes deviated slowly and forcibly to the left, and remained there for two or three minutes. When the right ear was similarly irrigated there was no nystagmus or deviation, but at the end of the process the eyes moved slowly to the right and became fixed, so that for a few seconds he could not even follow a finger or move them by rotating his head. He was remarkably tolerant to galvanic stimulation of the labyrinth; even 12 milliampères caused no vertigo, but it induced some deviation of the eyes to the right. Briefly, therefore, the quick phase of nystagmus was absent in this patient, who was by no means an isolated example. Another patient who had lost voluntary vertical movement showed forcible, almost violent, deviation upwards when rotated clockwise in a chair with the head bent to the right shoulder. With the head on the left shoulder both eyes deviated downwards, but in neither case did the rotation cause the normal nystagmus with a quick component downwards. Other observers had recorded the same phenomenon.

The Quick Phase of Nystagmus.

The highest levels of the central nervous system were probably concerned in the quick phase of nystagmus, which might be located in the cortex. On the other hand, typical labyrinthine nystagmus could be induced in animals from which the whole brain above the mesencephalon had been removed; the cortex might, however, play a more important part in the optic reflexes of the higher animals. There was no evidence in favour of the influence of the cortex on the quick phase of nystagmus, except that cold aural irrigation produced conjugate deviation instead of nystagmus in patients comatose from various causes. This phenomenon had been ascribed to inactivity of the cortex in coma.

The inevitable conclusion seemed to be that the symptoms seen in these patients were due to damage of some mesencephalic structure by a lesion which at the same time interrupted the paths of voluntary movement of the eyes in the immediate neighbourhood of the vestibular apparatus. In some of these palsies

stimulation of the labyrinth might make voluntary deviation possible. There had been much discussion of this relative movement, which was generally regarded as a labyrinthine reflex. Certain observations, however, were hard to explain on this hypothesis, and suggested a calcarine-cortical reflex. The weight of evidence, however, was in favour of the labyrinthine origin.

If the head of the first patient were passively rotated in a dark room with his eyes closed, the eyes deviated to the opposite side, but more promptly and forcibly to the right than to the left, while vertical movements could not be provoked. Since retinal impressions were certainly not active, this deviation must have been excited by proprioceptive impulses, either from the labyrinth or from the muscles of the neck, probably the labyrinth. Later on, when he had begun to recover, he was tied in a chair with his head fixed so that no neck movements were possible; his eyes were closed, the room was darkened, and the chair tilted to the right through 90°. No deviation was obtained, but by this time a fair range of voluntary movement to the left had been recovered. If the chair were tilted to the left through the same angle, the eyes deviated strongly to the right and stayed there. The deviation was always more marked if the movement were slow and uniform than if it were quick or irregular. The fact that the semicircular canals were more stimulated by rapid movement suggested that spastic deviation of the eyes in the direction in which movement was lost might be excited by the otoliths.

The Maculo-calcarine Reflex.

The ability to follow a fixed object if moved slowly and steadily had been noticed in most of the recorded cases, but was defective or absent in some. One patient could not bring her eyes above the horizontal; clockwise rotation in a chair with her head on her right shoulder produced no nystagmus or deviation, but opisthotonus and faintness. In some patients the eyes failed to follow an object, but they could usually follow it if it were moved at a uniform slow rate. There must be separate mechanisms involved in these two forms of deviation. No part was played by the labyrinth when the head was fixed; retinal impressions only were active. Some authorities thought the deviation was evoked by a short direct reflex through the superior quadrigeminal body and external geniculate body, but this was disproved by the fact that only objects in the field of attention and fixed by the conscious will could be followed; it was of no use to move some chance object. The reflex was a true cortical one in which the calcarine visual sphere was active. The affective stimulus must come from the region of the maculæ, therefore the reflex was maculo-calcarine. Apparently only impressions from the immediate neighbourhood of the fovea were potent, so that steady movement of the object was essential in order that the eyes might make a series of minute movements, each of which brought an extra-foveal image on to the fovea, in the same way that the first patient climbed from letter to letter in reading. The patient was, in fact, able to deviate his eyes through a very small angle. The path of the maculo-calcarine reflex was conjectural.

In two patients optic nystagmus had been investigated from another point of view. A drum with figures on it had been rotated vertically. Normally this led to nystagmus with its slow phase in the direction of rotation as seen by the patient. In this nystagmus the cortex intervened; it depended on the integrity of a path between the visual area and the frontal lobes. In one patient the drum produced normal nystagmus when rotated on a horizontal axis, but rotated on a vertical axis it caused no nystagmus but extreme deviation of the eyes in the direction towards which the slow phase of nystagmus would have occurred. The eyes remained fixed for several seconds. Another patient had lost voluntary upward movement. When the drum was rotated upwards on a horizontal axis the eyes deviated upwards spasmodically. It was, therefore, possible to evoke spasmodic deviation like that of labyrinthine stimulation by visual stimuli alone. The deviation was always in the direction of the slow phase of the absent nystagmus and persisted for some time, in one case for five minutes; the patient was unable by voluntary effort to return the eyes to the position from which they had been deviated. Neither labyrinthine nor proprioceptive neck mechanisms were concerned in this deviation, which must be caused by retinal or ocular stimuli. No other form of prolonged retinal stimulation had the same effect, so the cause was probably proprioceptive apparatus in the orbits or ocular muscles. There was a release of some subcortical mechanism, probably in the mesencephalon.

Oculogyric Crises.

One patient had complained that her eyes were "not under control." The first patient had given an intelligent description of the same sensation. Six months after the onset of his trouble, when rapid improvement was setting in, he had first experienced double vision, which he attributed to the spasmodic inturning of the right eye, which might remain fixed for a couple of hours. A few months later the left eye began to do the same thing, and might stay fixed for two or three days. Three years later, when some voluntary movement had been regained, the eyes would at times, especially first thing in the morning, turn to one side and stay fixed for a few seconds. The patient said they seemed "too loose" and that they "rolled about, so that he could not get them on the thing he wanted to see." This suggested the oculogyric crises of epidemic encephalitis. There were two types of spasm: spasm of individual muscles and conjugate deviation as in oculogyric crises, and the deviation excited by labyrinthine and retinal stimuli. Compulsive ideas and other mental stimuli appeared in oculogyric crises. The patient in whose eyes a rotating drum caused deviation complained of discomfort and, as deviation increased, of actual pain, until finally he sweated and shrieked that his eyes were being torn out of his head and the test must stop. He used the same word "agony," so often used by sufferers from oculogyric crises.

Although these patients eyes could not be moved voluntarily they often moved involuntarily, as if exploring space around them, when the attention was diverted from the eyes. This often suggested an hysterical origin of the trouble but really indicated lower level mechanisms which had escaped damage. Dr. Gordon Holmes said he had tried to provoke these movements, but had only succeeded in one man who was unable to deviate his eyes to the right. If his head was fixed and a loud and unexpected sound was made to his right, his eyes would sometimes come round for a moment in the direction of the sound. Oppenheim had also obtained this reaction to sound.

No anatomical findings had been published in these dissociated supranuclear ocular palsies. In most cases the trouble was undoubtedly a thrombosis or hæmorrhage. Localisation had been determined in two patients, and in both the site had seemed to be in the mid-brain. In a few of the earlier cases extensive bilateral softening of the forebrain had been found.

A vote of thanks to the President was proposed by Dr. A. S. BARNES and seconded by Prof. EDWIN BRAMWELL.

BIRKENHEAD GENERAL HOSPITAL.—Last week a new out-patients' department of this hospital was opened. The accommodation includes a large waiting-hall, the usual examination rooms, an orthopædic room, eye, ear, nose, throat, and dental departments, an almoner's office, and a buffet for the refreshment of patients from a distance.

"TINFOIL BEDS."—The Province of Mercia of the Ancient Order of Druids last week completed the payment of £1250 for the dedication of a bed in the Birmingham General Hospital. The money has been derived from the sale of tinfoil. The Druids have from this source endowed 20 beds in various hospitals since 1910.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

Dr. J. F. HALLS DALLY delivered the presidential address before this Society on Oct. 4th. The following is an abstract of what he said on

LOW ARTERIAL BLOOD PRESSURE.

Hypopiesis includes all forms of absolutely low arterial pressure, whether these be physiological or pathological, temporary or permanent. Any pressure which falls below the limit of 110 mm. Hg systolic is said to be absolutely low, since those above 110, which may be relatively low for age, sex, and body-weight, fall into a different category. The diastolic is prone to vary more widely. One person, for example, may have a systolic of 100 and a diastolic of 80, while another may have a similar systolic of 100, but a diastolic of 55. Of the two pressures, the diastolic is of by far the greater importance, since it is a more constant indicator not only of the propulsive force of the heart and of the eliminatory capacity of the body, but also of peripheral resistance and vasomotor nervous tone. Hence, in the absence of disease of the heart muscle or valves, a notable fall in diastolic pressure, such as occurs in conditions of shock, points to peripheral damage to the vessels. A further illustration may be noted during the acute stage of influenza. Often the lowest average diastolic pressures are found in association with autonomic-endocrine disturbances, and the highest in nephritis. In general it may be said that the common range of absolutely low arterial pressures is from 110 to 90 for the systolic pressure, and from 80 to 60 for the diastolic pressure at adult ages in men, and slightly less for women.

Low Pressure as a Symptom.

Low arterial pressure is met with as a symptom of many diverse conditions. Physiologically it is induced temporarily as a result of quiet sleep, recumbent rest, fatigue, moist heat, the menstrual cycle, pregnancy, and labour. It tends to become permanent in athletes, in those of placid and gentle temperament, in routine occupations, uncomplicated old age and warm climates. It follows acute collapse and shock, intoxications and circulatory disorders. It may be congenital and persistent, or acquired and persistent. It accompanies nearly all the acute infections, chronic states attended by wasting, certain constitutional affections, the anæmias, chronic infections and intoxications, and as a terminal event. Thus the list of associated conditions is a long one, and since low arterial pressure has been stated by every previous observer to be compatible with perfect health, it will readily be appreciated that the scanty literature on this subject has reach no definite conclusions about its ætiology.

The only way in which the paradox becomes simple is first to dismiss groupings based solely on clinical or anatomical conditions of association, and next closely to examine hypopiesis in the light of modern conceptions of metabolism.

Any factors that upset metabolic balance cause either nutritional or endocrine disequilibrium, or both. Hormonic dysfunction in combination with vasomotor disturbance leads to variations in arterial pressure, and inability to respond to stimuli in adequate fashion tends to produce symptoms of insufficiency of which low arterial pressure is one of the most important. Thus I have sought a comprehensive and unifying principle that would explain the striking diversity of association of low arterial pressures, and would link them with the incidence under opposite conditions of high arterial pressures. This unifying principle has been arrived at along the lines of biochemical investigation, and by expansion of the well-known dictum of the late Sir James Mackenzie that "response to effort" is the most valuable test of circulatory efficiency. Hence I have stated as "The Biological Law of Hypopiesis" that "low arterial blood pressure is always to be regarded as an expression of a low vitality state." In other words, the hypopietic subject is never a normal individual, but exists in an inferior constitutional state in which he suffers from inadequate and low reactive capacity to normal and abnormal stimuli. Up to a point stimulation is beneficial but, even so, the reactive capacity is diminished as compared with that of subjects in perfect health, and, if stimulation be carried to a point just beyond the narrowed limits of reserve force, depression of vital energies rapidly ensue. The whole matter resolves itself into cellular, lymphatic, capillary, and endocrine balance.

For diagnosis and prognosis it is necessary (1) to differentiate the case capable of reacting to stimuli from that which is incapable, and (2) in the former case to assess the degree of reactive capacity. This may be done by hypodermic injection of 1 c.cm. of 1 in 1000 adrenalin solution. Pressures are recorded at the end of each five minutes for four consecutive readings. Such a series of observations shows that, whilst in some people after injection the pressure levels rise, in others there is little or no change.

Clinically, low pressure subjects tend to poor bodily build; they are thin and pallid, with narrow chests, low diaphragms, and small elongated hearts. Length predominates over breadth. Through errors of assimilation they are deficient in calcium and other vital salts. Hence they are prone to respiratory diseases. At school unstable and unsatisfactory they do little that is worth while. Mental response is slow, although given sufficient time a correct answer may be elicited. In games they are usually ineffective, and though able to sprint 100 yards, they cannot last a 220 yards' race, nor keep up with their fellows in long-distance runs. Lethargic and easily fatigued, the capacity for sustained interest is lacking, and they soon become bored. Notwithstanding a poor youth, as life goes on these subjects tend to improve, and, though during childhood and adolescence frequently requiring medical attention, seldom need a doctor after 50, and often live to a ripe old age. Tardy in development and sluggish in habit, they are static rather than dynamic, taking long in their profession or business to make good, but in later life are often found to have shot far ahead of their high pressure competitors, who in early days carried all before them in work and sports. The last stages of these high pressure people are worse than the first, whereas low pressure subjects, having fought through their initial disabilities, from the standpoint of longevity are welcomed by life assurance companies. Naturally there are exceptions to the rule, hypopiesis being at times encountered in those of sthenic habitus, but, even in these, careful investigation often reveals evidences of narrowed reserve capacity. The basic proposition that hypopiesis is invariably an expression of low vital capacity based on inherent or acquired nutritional defects has proved a stumbling-block to those who cite the performances of certain athletes in support of their contention that low arterial pressure is compatible with well-sustained effort such as long-distance running. If one analyses these cases, however, one finds that the majority do not belong to the class of absolute hypopiesis with systolic pressure below 110 mm. to which my law refers, but are in reality instances of relatively low arterial pressures ranging above 110.

Control of Low Pressure.

Touching control, low pressure cases fall into three groups:—

1. Those who require no treatment. The acquired class including many athletes who present no symptoms, and in whom the diagnosis is made solely by the sphygmomanometer, fall into this group, as well as those apparently fit for all ordinary affairs of life, and particularly for those above 50 in whom low pressures are often salutary.

2. Those in whom treatment is usually ineffective. With increasing knowledge this group becomes smaller. It includes diatheses, such as status lymphaticus, infantilism, myasthenia gravis, adiposis dolorosa, &c., which appear to rest upon a basis of disordered

endocrine function. Certain of these may be relieved by hormone therapy.

3. Those in whom treatment is required :—

(*a*) *General Measures.*—Daily life should be so regulated as to conserve energy and to raise the standard of vitality. It is a mistake to try to raise pressures too rapidly. In the former case metabolic balance may be still further upset, whilst in the latter throbbing in the head, followed by irritability, may be induced. Seldom is it necessary, or even possible, to raise pressures to any great extent. Experience shows that a rise in pressure of only a few millimetres makes all the difference between comfort and discomfort. One should be content gradually to raise pressures to and maintain them at a level which appears to be the optimum, checking results by readings at regular intervals. Diet should be nourishing, balanced, and easily assimilable. A sufficiency of vitamins should be ensured. In addition to ordinary drinks, a pint of water for each 5 st. of body-weight should be taken daily. As a general rule alcohol is best avoided, but in cases of gastric neurasthenia, or anorexia due to mental or physical exhaustion, a little stimulant with meals tends to restore vital balance. For exhaustion bed is indicated, followed by rest after the chief meals, and by early hours. Exercise should never be persisted in till breathlessness, palpitation, or other symptoms supervene. Horse-riding and dancing, within moderate limits, by sending up arterial pressure to more standard levels, act as beneficial stimuli. Excessive exertion depletes vitality and drops pressures to levels of discomfort. Graduated exercises, at first on the level and later on prescribed gradients, favour oxidation and counteract respiratory deficiency. These objects are also furthered by physical exercises of stretching and bending, in combination with deep breathing. For most hypopietics who live in cold, damp, and changeable climates holidays and sunshine are beneficial. The craving for sunshine is often greater than that for food.

(*b*) *Special Measures.*—Relaxation, passive movements, massage with graduated resistance exercises, ultra-violet radiation, static electricity, oxygen foam baths or injections, and hydro- and balneo-therapy all have their appropriate uses. In the majority of cases of hypopiesis endocrine dysfunction is present. Thyroid gland should not be given in too large doses, otherwise further instability may be added. It should be combined with other glands in accordance with definite indications. Next in importance comes the pituitary. Whole gland, in doses up to two grains, thrice daily is given until slight throbbing in the head or palpitation point to the limit of tolerance. Thereupon the dose should be reduced by half, continued for several weeks in accordance with pressure readings. A convenient method of giving posterior pituitary is by an intranasal spray. As pitrescin it may be given hypodermically. Whole gland pituitary and suprarenal when administered by mouth are best prescribed with a coating so as to render these glands insoluble in the gastric juice. Pure suprarenal crystalline substance (tab. supramedulla) is active by mouth, and may be given in dosage of gr. 1/1000 up to gr. 1/100 twice daily. Pluriglandular syndromes may originate in disorders of the gonads, but up to now I have found no testicular or ovarian preparation to fulfil its promise. Most parathyroid preparations by mouth are inert, parathormone hypodermically or intramuscularly being the only one that yields appreciable results. As regards drugs, ephedrine is one of the most generally useful. It possesses low toxicity and stimulate cardiac action, at the same time increasing basal metabolism and urinary output. The usual dose is gr. ½ in tablet form by mouth, or hypodermically if more rapid action is desired. For emergencies, cardiazol or coramine are serviceable. In cardiac failure, nothing equals standardised preparations of digitalis in sufficient amount. Similarly with auricular fibrillation, quinidine being also useful in certain of the more chronic forms if cautiously administered.

In acute infections low arterial pressure is brought about by a combination of vasomotor paresis with myocardial weakness and hormonic depletion. Treatment should be directed to whichever of these factors is in the ascendant. After diphtheria, influenza, and pneumonia it is essential that during convalescence the heart shall be given prolonged rest. For rheumatic fever rest must be continued for three months or even longer, otherwise a state of permanent low pressure may be entered upon.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(*Continued from p. 774.*)

SECTION OF PHYSIOLOGY AND BIOCHEMISTRY.

Physiological Tests of Renal Function.

Prof. H. S. Raper (Manchester) being in the chair, Prof. E. B. Verney (London) opened the discussion by defining tests of renal function as observations of the response of the kidney to stimuli superimposed upon that which it is already receiving, and interpreted in terms of renal reserve. Renal reserves, he said, were *structural*, in that there was a large excess of renal tissue over and above that which was competent to carry on the excretory work during resting metabolism, and *functional*, represented by an inherent and variable capacity for the performance of increased work. He briefly reviewed the work of A. N. Richards and his colleagues which so clearly establishes the existence of these reserves, which, he held, constituted a first line of defence against the inroads of disease. First, as the work demanded of the kidney increased more units (glomeruli plus tubules) would become active and the rest pauses would be diminished. As the work demanded of each unit increased further its commencing failure would be reflected in changes in the composition of its secretion, a change exhibiting an approach towards the composition of blood plasma, such as is seen in the polyuria of chronic nephritics. This change in composition indicates a drain on functional, as against merely structural, reserves, and is probably initiated by a change in the glomerular capillary pressure.

An analogy was here suggested, said Prof. Verney, with the work of the heart as observed in the Starling heart-lung preparation, and he went on to develop the comparison between right auricular and glomerular capillary pressures. In the kidney, however, the work is osmotic in character, and to all intents a kidney engaged in producing a urine having the same composition as the protein-free filtrate of the blood plasma is doing no work; failure is complete. As Rose Bradford had demonstrated, a diminution in the amount of kidney substance led to an increase in the urine production of the remaining tissue. Similarly, a diminution in the anatomical reserves of the kidney was partially or completely compensated by an encroachment upon its functional reserves. Further guidance in the interpretation of a case was afforded by the facts that the excretion of urea and the substances eliminated by a similar mechanism was dependent mainly upon the *amount* of kidney substance, that of chloride mainly upon the *rate* of urine flow.

In renal failure there were theoretically three types to be considered: (1) that due to a severe diminution in the number of renal units; (2) that due to a fall in the magnitude of the pressure stimulus; and (3) that due to impairment in the tone of the secretory units, and possibly there was a clinical parallel to all three of these, or all might be involved together. Caffeine had been shown to affect the number of effective glomeruli and the pressure stimulus, and much might be learnt from the response to its exhibition under controlled conditions. The

surest indication of renal function would, he concluded, be given by administering urea or some such substances as phenol red, and comparing the elimination in a given time at any given concentration in the blood plasma with that of the normal. Any assessment of renal reserve was, however, fraught with difficulty.

Discussion.

Sir WILLIAM WILLCOX (London) said he regarded the information given by blood-urea determinations as most useful, especially in colon bacillus infections, and in chloroform and alcohol nephritis, but we must remember that the blood-urea concentration might be high without serious import. The indigo-carmine test was useful, but he did not use phenol-sulphone-phthalein as he had found that its excretion might be identical with that in the normal subject in a patient at the very onset of uræmia. Observations on the rate and concentration of chloride excreted were of great value. He had found caffeine citrate useful for a short time only, a few days at the most. There was no doubt, though it was liable to be overlooked, that uræmia might be purely cardiac in origin instead of being due to damaged kidneys.

Prof. E. C. DODDS (London) said that in assessing the value of a test we must ask ourselves to what aspect of kidney function the test was directed. The tests were of value in estimating the extent of the lesions in chronic nephritis, with or without œdema, in albuminuria prior to the administration of an anæsthetic, and in renal dwarfism. He recommended the estimation in the blood of urea, non-protein-nitrogen, cholesterol, and total protein, these last two being especially helpful in the œdematous type of nephritis. Patients with low cholesterol and total protein responded well to a high protein diet. As an aid to prognosis in cases of uræmia he recommended the estimation of blood calcium and phosphorus. He would like to emphasise his view that the mere estimation of blood-urea was liable to lead to a fallacy, if a look out was not kept for dehydration, which alone might account for a blood-urea of over 100 mg. per 100 c.cm. An estimation of the total solids of the blood in such a case might show a rise from 20 to 28 per cent. As regards urine analysis, if the urea reached 2 per cent. or over gross renal changes might be regarded as excluded.

Prof. J. SHAW DUNN (Manchester) described the results of his observations on animals, both normal and diseased. He had so far failed to produce experimentally the equivalent of human nephritis. In man the damage was usually glomerular at first, in animals there was a tubular necrosis affecting urea excretion, but water and chloride excretion was not affected till later, with the onset of œdema. He had repeated Frankson's work on urea excretion, urea being given by the mouth, and was able thus to induce the non-drinking rabbit to become a water-drinker for the elimination of the urea. In animals with nephritis urea by the mouth caused a large rise in blood-urea when on a dry diet, but no rise in urinary urea, and it was clear that the rise in blood-urea was greater than could be accounted for, as Prof. Dodds had suggested, purely by a concentration of the blood. He would like to stress the importance of free water-supplies for the excretion of urea, and the value of dry diet as a test of urea excretion.

Mr. H. D. KAY said that a simple and conclusive test, devoid of ill-effects on the patient, was still to found, but that the glycerophosphate test, which had now been tested on 70 cases at the London Hospital, had definite advantages over the urea-concentration and phenol-sulphone-phthalein tests. The principle of the test lay in the estimation of the excess phosphate excretion after the administration of sodium β-glycerophosphate, a chemically pure substance which was cheap and easily obtainable, harmless, and sterilisable. The routine of the test was as follows: At 8 A.M. the bladder is emptied, 400 c.cm. of water or weak tea is taken, and at 9.30 A.M. 10 c.cm. of a sterile 8 per cent. aqueous solution of the drug, corresponding to 550 mg. of phosphate, is given intravenously. The urine is taken in an hour, and its phosphates estimated after precipitating the proteins. The excess of phosphate may vary from nil (in chronic nephritis) to 250 mg. or more. After a solution had been prepared only two urinary analyses were required, and these could be satisfactorily performed by any sensible laboratory attendant. There was no decomposition of the substance to be estimated if the analysis could not be done at once, and the test was independent of the volume passed and unaffected by urinary pigment or blood. Their results so far had been as follows:—

1. A normal subject excretes at least 150 mg.
2. If there be less there is renal involvement, which varies inversely as the amount excreted.
3. The test compares favourably with any other test as regards the correspondence of its finding with the whole clinical picture.

Mr. J. B. MACALPINE (Manchester) spoke as a genito-urinary surgeon who was using these tests constantly. Estimation of the blood-urea, he found, brought precision to his knowledge, and was a great help as a supplement to the clinical picture. He regarded the tests as widening the rungs of the uræmic ladder; for example, before a prostatectomy he carried out bladder drainage until the blood-urea fell below the 40 mg. level. Sometimes the drainage provoked a profuse polyuria. He had got over 200 ounces from one case within 12 hours. This polyuria, when extreme, was an unfavourable omen, tending to end with a fatal anuria. As regards tests of the separate function of the kidneys this was a cystoscopic problem, and he liked the indigo-carmine test because it was simple, quick, and avoided ureteral catheterisation. He was unwilling, where it was avoidable, to catheterise a possibly aseptic kidney through a septic bladder, and he was not a strong believer in the quantitative value of the urea-concentration and phenol-sulphone-phthalein tests because he had satisfied himself that urine escaped around the average ureteral catheter. Mr. Macalpine also dealt with the problems of hypertrophy and the great value of pyelography, especially in stone, and particularly where a stone was seen on one side and the other kidney seemed to be inactive.

Dr. F. H. SMIRK (Manchester) described the effects on the normal and the nephritic of the administration of water, urea, and caffeine by the mouth. In the nephritic the loss of water was slow and delayed, and, after urea, the urinary urea concentration might even fall. After urea the sodium chloride excretion rises in the normal but not in the nephritic, and of 22 normals examined 18 had above 0·8 per cent. sodium chloride, while of 60 nephritics only 4 had above 0·8 per cent. He had tried giving grs. 5 of caffeine by mouth as a routine test, and found this increased the chloride excretion out of all proportion to the other constituents. The urea increase was less marked. Caffeine caused a greater rise in chlorides than urea did.

Prof. E. P. POULTON (London) took Prof. Verney to task for not developing, from his extremely valuable observations on kidney function, a physiological theory of Bright's disease. To the glomerular filtrate, which could be increased by caffeine, the tubule added urea and subtracted chloride and (at a more distal point) water. Bright's disease was primarily due to impervious glomeruli. He did not approve of Calvert's test, and thought that half the value of the urea-concentration test was lost if the total excretion was not considered as well as the concentration.

Mr. J. SWIFT JOLY (London) thought that, from the surgeon's point of view, an excretion of 1 gramme of urea per hour was satisfactory. He agreed with Prof. Poulton that for this water was necessary.

Reply.

Prof. VERNEY said there was so much disagreement as to the precise location of the functions of the

kidney in the organ itself that he preferred not to dissociate entirely glomerulus and tubule. He had been very pleased to hear of the use of the caffeine test by Dr. Smirk, and was full of admiration for Mr. Kay's contribution to the discussion.

SECTION OF PUBLIC HEALTH.

HUMAN TUBERCULOSIS OF BOVINE ORIGIN.

DR. W. G. SAVAGE (M.O.H., Somerset), in opening the discussion, estimated the human deaths caused annually by the bovine tubercle bacillus at 2000 to 2300. Most of them were the deaths of children, and we had no knowledge as to how many non-fatal infections occurred. As to the extent of bovine tuberculosis among cattle in this country, he thought that about 40 per cent. of the cows were infected; that about 1 per cent. of the cows were "open" cases; and that about 0·3 per cent. had tuberculosis of the udder. He passed on to consider methods for the reduction of the prevalence of tuberculosis in cattle under five heads:—

(1) *Elimination of all tuberculous cattle*—viz., by the destruction of reactors. This could be done successfully in small areas—e.g., the Channel Islands. It was the official plan in the U.S.A., where 207,830 tuberculous cattle were slaughtered in 1927. The average percentage of reactors in the U.S.A. was only 3·3, and it would be impracticable in England with more than ten times that percentage of reactors to adopt the elimination plan.

(2) *Building up of herds free from tuberculosis.*—The procedure advocated by Prof. Bang was theoretically easy, but there were many administrative difficulties, and the method even in Denmark had not made the progress that was expected. The same principle had been followed in England with regard to Certified and Grade A (T.T.) milks, but the increase in the number of herds, which produced these two designated milks, had been slow. At the end of September, 1928, there were only 152 Certified and 207 Grade A (T.T.) milk producers—an entirely insignificant proportion of the whole. In Somerset, with at least 7300 producers, there were only 11 producers of these two types of milk at the end of 1928. This method could not, therefore, be regarded as a practical solution of our problem.

(3) *Elimination of particular classes of tuberculous cows.*—Theoretically we could reduce the infection among bovines and the risk to humans if we eliminated all infectious cows. In fact, however, partly from administrative but mainly from scientific difficulties these animals were not removed from the herds as soon as they became "open" cases, but only after they had done most of the harm they were capable of doing. The discovery of the infectious cases was not being followed up by a systematic examination of the other animals, and the cases of tuberculosis of the udder were not being detected until after the milk-supply had been affected for long periods. Systematic veterinary inspection was being urged as a means for the reduction of the amount of bovine tuberculosis. The first difficulty was that the ablest veterinary inspector could not detect infectious animals in their early stages, and the second difficulty was that financial considerations severely limited the frequency of inspection. The third difficulty was: Would the removal of some of the infection in the case of physiologically overlooked cows play any decisive part in reducing the amount of bovine tuberculosis? The figures available from places where routine inspection has been in vogue for years did not show any such reduction. He estimated the cost of an adequate system of veterinary inspection at about £300,000 a year, and was of opinion that veterinary inspection must stand or fall on its merits as a means of reducing bovine tuberculosis. The onus was on their veterinary friends to demonstrate that veterinary inspection could bring about such a reduction. If it could, it was a true preventive measure and worth the price.

(4) *Measures directly aimed at reducing the amount of tubercle bacilli in milk.*—When milk was found to contain tubercle bacilli, it was feasible in something like 60 per cent. of the cases to find an infective animal and eliminate her, but only an insignificant proportion of the milk-supply was tested for tubercle bacilli, and after the expenditure of public money in searching out the cow with the tuberculous udder the farmer was in no way penalised, but, on the contrary, received compensation for the cow. Pasteurisation of the milk-supply would probably largely eliminate the dangers of tuberculous milk. Its adoption would be a confession of failure, and the acceptance of the second-best.

(5) *Immunisation of cows against tuberculosis.*—Calmette's vaccine was on trial, and should be very fully tested, but the latest results were not very favourable.

After considering the various remedies advocated, Dr. Savage went on to summarise his suggestions. Routine veterinary inspection as a thing by itself he considered was not worth doing, but it occupied quite a different place as part of a comprehensive attack on bovine tuberculosis. The cow should be kept under much more open-air conditions. A more active educational campaign must be undertaken. Part of the onus of preventing the spread of infection must be put on the cow-keeper. Feeding problems and other factors likely to affect tuberculosis must be carefully considered. In such a comprehensive scheme immunisation experiments, the formation of tubercle-free herds, the operation of a modified Tuberculosis Order, and the routine veterinary inspection of cows will all find a place. If the agricultural community was not prepared to coöperate actively in the schemes of the State, and of local authorities for reducing the incidence of bovine tuberculosis, pasteurisation seemed less of an evil than "the present tinkering procedures." He himself, however, favoured the adoption of a comprehensive scheme such as he had indicated.

Discussion.

Colonel J. W. BRITTLEBANK (Chief Veterinary Officer, Manchester) thought that Dr. Savage was unduly pessimistic. He estimated the loss to agriculture through bovine tuberculosis at £1,000,000 annually. He thought something had been done to reduce the incidence of tuberculosis by veterinary inspection in Manchester from 1904 onwards. The West Riding, Cumberland, and Durham had all adopted veterinary inspection, and such schemes should not be limited to inspection, but include feeding, housing, management, &c.

MR. A. GOFTON, M.R.C.V.S. (Edinburgh), thought Dr. Savage's figures of the incidence of bovine tuberculosis were too low, and that the percentage of cows with tuberculous udders in Edinburgh was nearer 0·5 than 0·3. The designated milk scheme had made a great appeal to the agricultural community, and the safe milk in question, in both Edinburgh and Glasgow, very largely went to the children who were most at risk. He regarded the Tuberculosis Order as purely a public health measure, and he believed that the Order and veterinary inspection had been instrumental in bringing about a reduction in the incidence of tuberculosis among Edinburgh children.

DR. F. H. MORISON (M.O.H., Cumberland) thought that 5 per cent. of the cows had diagnosable tuberculosis. He referred to the dope use of tuberculine, and to the difficulty in maintaining herds free from tuberculosis. He had found Certified milk highly infected with tubercle bacilli. The graded milks were a failure, and pasteurisation was only doubtfully safe. He believed that milk dried by the roller process was the best solution, and he looked forward to the establishment of milk-drying factories throughout the country.

DR. T. EUSTACE HILL (M.O.H., Co. Durham) said that his county had just appointed a chief veterinary surgeon and four whole-time assistants. They would both inspect the cattle and preach

sanitation. He anticipated an enormous improvement in the sanitation of the cow-sheds as a result. When milk samples were found to be tuberculous they usually succeeded in finding the offending cow. They had found the direct microscopical test quite useful in saving the delay incidental to the biological test.

Dr. MIDDLETON MARTIN (M.O.H., Gloucestershire) said that their cattle were examined every half year by part-time veterinary surgeons, but that they seemed to get the same percentage of emaciation, &c., at each inspection.

Dr. VEITCH CLARK (Manchester) stated that they had succeeded in maintaining a tubercle-free herd for supplying the local hospitals.

Reply.

Dr. SAVAGE remarked that Colonel Brittlebank had not answered his question as to the resistance to infection of a physiologically overworked cow. If inspection was to be adopted it must be thoroughly done, and at least every quarter, and, of course, if the cows were out at grass, it was the farmer's business to bring them in for the inspection.

SECTION OF ANÆSTHETICS.

SPINAL ANÆSTHESIA WITH SPINOCAIN.

Dr. GEORGE P. PITKIN (New Jersey, U.S.A.) gave an account of the experimental work done by himself and his co-workers in producing what he claims to be a controllable spinal anæsthetic. They set out, he said, to produce a spinal anæsthetic that would minimise toxic reactions, be certain in effect, constant in duration, act in direct ratio to the amount of anæsthetic agent injected, and be without effect on the heart action, vascular tension, and respiratory function. The chief factor in the control of a spinal anæsthetic being to prevent its diffusion in the subarachnoid space, they had tried to find a substance which would prevent this diffusion until the anæsthetic had been absorbed. They had evolved what, for the lack of a better name, was called amyloprolamin; it was derived from gliadin, the mucilaginous content of wheat starch. They had also determined the capacity of the dural sac at various heights in adults and in children of different ages. Novocain was chosen from the other drugs used in spinal anæsthetics as giving a complete anæsthesia of the sensory nerves, affecting the tactile and muscular sensation only slightly, not increasing the cell count of the spinal fluid, and not raising the intradural pressure. Faulty technique was responsible for the production of hypotonic headaches, which were more often seen when the puncture was made with the patient sitting up, owing to the greater amount of spinal fluid lost. To prevent extensive trauma of the dura the use of needles of small gauge with a short bevel was advisable. As a result of these experiments and reports on over a thousand inductions they were now justified in asserting that spinocain was controllable within the dural sac. This method of producing spinal anæsthesia had been developed as a protection to the surgeon, owing to the difficulty of procuring expert anæsthetists, the large proportion of anæsthetics in the United States being given by nurses who were merely technicians. He considered it important that the technique of giving spinocain should be in expert hands. Dr. Pitkin concluded by showing on the screen the essential points of his method.

Dr. FRANK A. KELLY (Detroit) limited himself to the clinical aspects of controllable anæsthesia. He said that Dr. Pitkin's technique had negatived all previous objections to spinal anæsthetics. The transitory nature of the anæsthetic had been corrected by the addition of a mucilaginous substance, the height and extent of the anæsthesia was controlled by the tilting of the table, the depression in blood pressure—so often a serious objection in the past—was prevented by the preoperative injection of ephedrine. Another safety factor of great importance was the use of the lighter gravity solution, for if a serious fall in blood pressure occurred the head of the table could be lowered so as to prevent cerebral anæmia. What they called low anæsthesia was a true sacral or caudal anæsthesia where only the perineum, vagina, and rectum were involved, together with the saddle area on the inner side of the thigh. In order to obtain this, one-half of an ampoule of spinocain was injected at the fourth lumbar interspace, and the patient immediately tipped into at least a 15° Trendelenburg position, the degree being reckoned by Dr. Pitkin's tiltometer. What they called high anæsthesia extended to the costal arch, and was obtained by injecting the anæsthetising agent into the first lumbar interspace and mixing it with 6 c.cm. of spinal fluid; when this anæsthesia extended to the costal arch it was considered complete, and the patient was placed in the Trendelenburg position to stop the upward extension. His experience in doing very high abdominal work was that if the anæsthesia was carried to a level high enough to allow the operation to be completed without difficulty, some patients complained of difficulty in breathing and a feeling of weakness. It was therefore his practice to limit the spinal anæsthetic, and to supplement it with an intercostal block of the eighth, ninth, tenth, and eleventh costal nerves at the angle. Ephedrine before the spinal injection prevented any fall in blood pressure; the drug, given intramuscularly or subcutaneously, acted as rapidly as when it was given intravenously, in contrast to adrenalin which, in skin or muscle, caused a local ischæmia, but was quickly absorbed intravenously, though its action was transitory. In a cinema demonstration Dr. Kelly showed points of technique, including a common fault in the position of the patient, resulting in a "corkscrew spine." He demonstrated the presence of peristaltic action during an abdominal operation under spinal anæsthesia, and explained it by the unopposed action of the sympathetic and vagal nerves, due to the blocking of the vasomotor nerves. Barbital, he said, was regarded as an antidote to novocain poisoning, but he had never had occasion to use it.

Dr. E. FALKNER HILL (Manchester) agreed that Dr. Pitkin's method did away with previous objections to spinal anæsthesia. From his own experience of the method, however, he was inclined to think that there was some fall in blood pressure due to operative procedure, but this was not a bad thing for the patient. He gave illustrations from bad surgical risk cases in some of which he had given chloroform and ether as well. He did not think that strychnine should be included in the anæsthetic solution, as it increased the irritability of the spinal canal.

Dr. A. L. FLEMING (Bristol) said he hoped Dr. Pitkin and Dr. Kelly might come to give their patients the benefit of inhalation anæsthetic as well. Peristalsis, he thought, was not always inhibited under an inhalation anæsthetic; he had seen it on one or two occasions.

Dr. K. B. PINSON (Manchester) gave his experience of stovaine and novocain anæsthesia; he had had only 55 per cent. of complete success on all counts, from the point of view of patient, operation, and recovery. He was much struck by the absence of shock with this method. He considered that 45 per cent. of failures made the use of spinocain something of an experiment; they might have been due to the human response to novocain. An improvement in the solution might obviate the difficulties.

Dr. W. SALISBURY (Northampton) narrated his success with stovaine and glucose in shock-producing operations. He always used the heavy solution, and attributed his success to attention to small points of technique.

Dr. DONALD said he had had a happy experience of spinocain in some cases; his six partial failures were all in young virile men with acute appendicitis. He thought that women and patients with lowered resistance did better under spinocain. He found it

difficult to decide whether the good effects he noted were due to the spinocain or ephedrine.

Dr. E. A. GERRARD (Manchester) gave an account of the use of spinocain in obstetrical work, noting the ease with which the cervix dilated, the extreme relaxation of the perineum, and the delight of the patient. The parturient woman could bear down better, because the pressure of the head on the perineum was not too painful. For instrumental delivery he advised that the anæsthetic should be carried higher than the sacral or caudal type; pituitrin should in any case be used with care.

Demonstrations.

Dr. G. A. SCHWARTZ (New York) gave a demonstration of the apparatus used in intratracheal anæsthesia and resuscitation by the Flagg method. He showed on the screen the intubation of the larynx by a flexible catheter, and a simple method of maintaining the anæsthesia by fixing a tube connected with the catheter to a can of ether. He also demonstrated on the screen the resuscitation of a new-born child with oxygen and carbon dioxide through a pharyngeal tube.

Dr. F. L. RICHARDSON (Boston, U.S.A.) gave a cinema demonstration on the teaching of anæsthetics. The student, he said, should be taught to give one or two drugs well; it was not possible to teach everything by the film, but important points could be brought out by slowing down the projection. The demonstration included the administration of spinocain and ether vapour.

Avertin.

Dr. G. EDWARDS (London) read a paper on the use of avertin or tri-brom-ethyl-alcohol, a white crystalline solid, soluble in water to the extent of 3½ per cent. at body temperature. Introduced in solution into the rectum it was readily absorbed, appearing in the urine in combination with glycuronic acid. Avertin was a basal narcotic; once a patient was under its influence only a very small quantity of inhalation anæsthetic was required to make the anæsthesia complete. The anæsthetic could be given in the ward without fuss, induction was gradual, and though the narcosis had been light there was no memory of anything unpleasant. Avertin was of particular value in dealing with highly nervous patients, with cases of Graves's disease, and with children. Avertin was contra-indicated in ulcerated conditions of the rectum and colon, in the presence of severe renal and hepatic disease, acidosis, and serious blood diseases. On the other hand, cases of hyperthyroidism tolerated massive doses of avertin and could eliminate them quickly. The fall in blood pressure was usually within the limits of that observed in deep sleep, between 10 and 30 mm. Hg. The respiratory centre was depressed, and a slight cyanosis was usually observed, more particularly after a preliminary dose of morphia. Marked cyanosis did not occur if the dose had not exceeded 0·1 g. per kilo of body-weight, and the airway was kept clear. Anæsthesia took 20–30 minutes to reach completion, the ocular reflexes disappeared in the usual way, and a skin reflex might remain. A sudden blast of strong ether vapour might produce a cough—a useful preliminary test to determine how much inhalation anæsthetic would be needed. The actual administration was simple; some observers thought it good to give a sedative overnight. The usual duration of narcosis was 1½–2 hours from the time of injection; about four hours from the start the patient was usually quite conscious. In only one case had he seen any trouble directly due to the avertin anæsthesia; in this case [1] the patient died 20 hours after the administration of a dose at the rate of 0·125 g. per kilo. Probably a deficiency of thyroid secretion had diminished the power of detoxicating and eliminating the drug. In delayed return to consciousness the respiration might be stimulated by injection of lobeline or inhaling carbon dioxide and oxygen, the circulation by injections of ephedrine.

Dr. E. F. HILL (Manchester) suggested that avertin, combined with spinal anæsthesia, would be an ideal anæsthetic.

Dr. H. P. FAIRLIE (Glasgow) described a case in which the patient did not respond well to avertin, but with gas-oxygen the operation went off well. The trouble with avertin began six hours after operation, when there was intense rectal irritation with diarrhœa and passage of mucus. He considered the death-rate with this method was unduly high.

[1] See THE LANCET, 1929, i., 1365.

Reviews and Notices of Books.

PHYSIOLOGY.

Bainbridge and Menzies' Essentials of Physiology. Sixth edition. Edited by H. HARTRIDGE, M.A., M.D., Sc.D., F.R.S., Professor of Physiology, University of London. London: Longmans, Green and Co. 1929. Pp. 497. 14*s.*

Elements of Physiology. By E. G. MARTIN, Ph.D., Professor of Physiology, Stanford University, California; and F. W. WEYMOUTH, Ph.D., Associate Professor of Physiology in the University, Philadelphia: Lea and Febiger. Pp. 784.

THE sixth edition of Bainbridge and Menzies' "Essentials of Physiology" has been revised and brought up to date by Prof. Hartridge. The book retains its original character—that is, it gives in a clear, dogmatic manner a brief but adequate account of human physiology. Certain sections are perhaps too brief—for example, the section on reproduction. Prof. Hartridge has, however, found space to mention a great deal of new work without materially increasing the size of the book. The new chapters on exercise and work, and on the nervous system are excellent—the diagrams in the latter being particularly good. Unfortunately, a few mistakes have been allowed to creep in—for example, on p. 495 we read that "Parkes and his co-workers have extracted from ovarian tissue a substance 'œstrin' which causes menstruation when injected into the blood," whereas, of course, it does not. The use in the index of thick type for the principal subdivisions under each letter facilitates quick reference to any subject.

Dr. Martin and his colleague have written their book with the object of expressing a point of view rather than that of teaching examination students. They explain in their preface that they have tried to present the subject of physiology "by development of two key-principles." The first consists in the application of physico-chemical laws to physiological processes, and the second is that "every protoplasmic cell is inherently a self-sustaining system." The book is divided into four chief sections, the first two of which contain material usually found in works on general physiology. It is written with little regard for economy of words; moreover, these tend to be arranged in sequences which seem strange to English readers. The second section of the book deals more systematically with human physiology. It is, however, very unequal, and the arrangement makes it difficult to read. For example, the section on the respiratory system does not mention hæmoglobin—for that we must turn to the earlier section on general physiology; in the section on digestion, the pancreas is discussed without mention of insulin, and here, too, we must refer back to the earlier section for complete information. Great prominence is given to the special senses, at the expense of other subjects; the section on the special senses contains 216 pages, that on the central nervous system only 45. From these examples it will be seen that the "key-principles" have not enabled the authors to give us a very clear general view of physiology.

RECENT ADVANCES IN SURGERY.

Second edition. By W. H. OGILVIE, M.A., M.D., M.Ch. Oxon., F.R.C.S., Assistant Surgeon, Guy's Hospital; Surgeon to Out-patients, Hampstead General Hospital. London: J. and A. Churchill. 1929. Pp. 495. 15*s*.

THE revision of this useful book has been well done, and the reader who depends upon one manual to keep him abreast of surgical thought will find that the author has not failed to record any of the important advances in surgical science since the first edition was published. Even more assiduous readers of surgical literature will be grateful for the admirable summaries of various topics of interest here set out. The book is more than a record of new surgical methods, good or bad; it is a discriminating account of what has happened in recent years and well deserves its title. Its compilation must have been difficult. Certain omissions and occasional evidence of reluctance on the part of the author to give adequate prominence to views or methods which he regards unfavourably are not wanting. But generally he has shown wise judgment both in his selection of material and in the manner of its presentation.

TREATMENT OF RHEUMATOID ARTHRITIS.

By A. H. DOUTHWAITE, M.D., F.R.C.P. Lond., Assistant Physician, Guy's Hospital; Honorary Physician, All Saints' Hospital. London: H. K. Lewis and Co., Ltd. 1929. Pp. 80. 6*s*.

PRACTITIONERS will find this an interesting and useful book. The author skilfully avoids the dogma of any extreme school of thought and sets out the known facts of an obscure subject with clarity. On the question of focal sepsis he is eminently sane, and in dealing with treatment he has not overlooked the need for practical advice on such subjects as climate and the correction of deformities. These are of great importance but are often neglected when the treatment of rheumatoid arthritis is being considered. On the endocrine factor and on metabolic features of the disease his views would invite comment in another connexion, but the interest of these matters is too academic to justify criticism of a book which is essentially practical.

GYNÆCOLOGY.

By LYNN LYLE FULKERSON, A.B., M.D., F.A.C.S., Instructor in Obstetrics and Gynæcology, Cornell University Medical School. Philadelphia: P. Blakiston's Son and Co. 1929. Pp. 842.

THE scope of gynæcology in America extends to the urinary system, the lower bowel, and the lower abdomen generally, and the impression given by this book is that gynæcology as we know it is to be correlated with diseases of the urinary tract and rectum rather than with the physiology and pathology of parturition. This attitude finds no favour in this country, but that will not prevent this work, which includes operations on the intestines and abdominal wall, from finding interested readers among general as well as gynæcological surgeons. The systematic teaching given by Dr. Fulkerson is clear and up to date, and many erroneous statements which make their wearisome appearance in successive editions of well-known books are corrected. For example, chronic endometritis is correctly described as a rare disease. In America radium has entirely replaced operation in the treatment of carcinoma of the cervix, and the radical operation is considered to be so obsolete that it is not even described here. On the other hand, some of the operations advised are seldom, if ever, performed in this country, particularly the exploration of the pelvis through the anterior and posterior fornices of the vagina.

Rather less than half the book is devoted to operative surgery. A good deal of space is wasted on the author's methods of sterilisation and theatre management. Many useful points are to be gleaned from the operations for displacement and prolapse of the genital tract which include George Gray Ward's technique for prolapse of the pouch of Douglas and rectocele. The author seems to like ligaturing pedicles by means of continuous sutures. A method of performing hysterectomy in which not only are all the vessels ligatured by one continuous suture, but the pelvic peritoneum is closed by the same suture, seems on paper to be a risky procedure. Myomectomy through the anterior fornix is not likely to be practised by British gynæcologists; it appears to have every disadvantage and no advantage over addominal myomectomy. There are over 600 illustrations in this book and they are exceptionally clear and apt.

THE STUDY OF PHYSIC.

An Introduction to the Study of Physic. By WILLIAM HEBERDEN. Prefatory essay by LEROY CRUMMER. New York: Paul B. Hoeber; London: Humphrey Milford, Oxford University Press. 1929. Pp. 159. 10*s*. 6*d*.

Dr. Crummer here prints, for the first time in book form, the manuscript of the elder Heberden's introduction to the study of physic and gives a reprint of the same author's classical account of angina pectoris—the whole being a reprint, with additions and corrections, from "Annals of Medical History" (Vol. X., Nos. 3 and 4, 1928). The author was lucky enough to discover in a second-hand London bookshop three manuscript volumes, one of which was the introduction to the study of physic in Heberden's holograph, and with his signature at the end of the preface. Comparisons with known Heberden manuscript at the Royal College of Physicians of London made it quite clear that this is a genuine Heberden item, and while congratulating the author on his good fortune, we may thank him sincerely for giving us the contents of a book by a very celebrated English physician, about whom we have always wished to know more. Heberden appears to have written the book for the benefit of any of his children who might contemplate taking up the study of medicine. It contains much shrewd advice as to what books to read and what practical studies are to be undertaken. Heberden's spelling is expressly preserved, but one or two odd mistakes have been overlooked in passing the essay through the press; Heberden was, we think, too good a classical scholar to have written "Demonsthanes" for Demosthenes, and there is a sad hash of Homer's description of Machaon on page 71. These slight blemishes do not detract from the value of this book as an addition to medical history. It is enriched with a fine representation of Beechey's portrait of Heberden, facsimiles of the preface to the book, and a letter from Heberden to William Hunter, the title page of the "Commentarii," and other illustrations.

ACUTE INFECTIOUS DISEASES.

Second edition. By JAY FRANK SCHAMBERG, A.B., M.D., Professor of Dermatology and Syphilology, University of Pennsylvania; and JOHN A. KOLMER, M.Sc., M.D., D.P.H., D.S.C., LL.D., Professor of Pathology and Bacteriology, University of Pennsylvania. London: Henry Kimpton. Pp. 888. 50*s*.

IN view of the mass of new knowledge accumulated during recent years on the acute infectious diseases this text-book has been thoroughly revised. Although a third of its bulk is devoted to the study of vaccination and small-pox, this volume deals minutely with the diagnosis and treatment and general care of practically all the infectious diseases met with in this country. One important omission is enteric fever, a disease which, though happily rare nowadays, is still worthy of a place in such a work as this. Many interesting tables and temperature charts are included, also 161 engravings and 27 full-page plates. All of these are

excellent and lifelike; among them are pictures showing the old method adopted of holding a patient during the operation of intubation in laryngeal diphtheria. The writers themselves recommend a slightly different technique, with the patient lying down instead of sitting up in the nurse's arms. Their ideas on the feeding of intubation cases are very sound. The book is undoubtedly an excellent one and provides interesting reading. The authors quote much evidence obtained from America and from British sources in support of their opinion that small-pox is commonly spread by aerial convection. Some public health authorities in this country may agree with this view, but experts on infectious diseases are rightly sceptical on this subject. Evidence to be valid must include proof that rigid precautions have been taken to ensure that the infection could not have been transmitted through the staff of an institution. The chapters on diphtheria, scarlet fever, and measles have been largely rewritten in order to include an account of the extensive work which has been done, chiefly in America, on the treatment and prevention of these diseases. The Schick and Dick tests are clearly described, and the methods adopted—in the attempt to prevent other infectious diseases such as measles and chicken-pox—are carefully considered. The clinician will find this book useful, since the authors have made full use of the recent contributions to the literature of the subject—not only by American authorities but also by European ones—and have thoughtfully dotted the pages with many useful references.

SKIN.

Its Uses in Six Phases. By LEWIS E. HERTSLET, M.R.C.S. Eng., L.R.C.P. Lond. London: J. and A. Churchill. 1929. Pp. 206. 10*s.* 6*d.*

THIS book will gladden the hearts of the fresh-air and sunlight devotees, who from a handful of so-called cranks have in the past few years developed, the world over, into national armies whose ranks will yet engulf the faltering remnants of the overclad. It was written, the author claims (p. 107), without a headache. It is doubtful if the careful reader will so easily escape, for the information has been collected from no less than 106 essays and papers on a variety of dermatological, social, actinotherapeutic, hydrotherapeutic, and physiological subjects; all the authors receive their measure of thanks and acknowledgment in tabulated form. The skilful compounding of their statements has resulted in a veritable encyclopædia of the functions of the skin such as is contained in no single text-book hitherto published. To those with sufficient power of concentration the work will reveal new aspects of the subject. We trust it will find its way to the precincts of those who have the power to raise the blind and let in the sunshine on the commonwealth of peoples.

THE CASE OF MISS R.

By ALFRED ADLER. Translated by ELEANORE JANSEN and FRIEDRICH JANSEN, M.D. London: George Allen and Unwin, Ltd. 1929. Pp. 306. 12*s.* 6*d.*

THIS is an autobiography, beginning in childhood and leading up to the development of a compulsion neurosis soon after puberty, of a young woman. Her motives are an open book to Dr. Adler when elaborated in the light of his belief that the raison d'être of neurotic disease is the attainment of a goal by influencing the environment. The translators' preface explains that such is the way of all neuroses and psychoses, "for whose recognition and description, the theory, and for whose prophylaxis and treatment, the practice of individual psychology serves." Dr. Adler's views are marked by simplicity, in contrast to the difficulties of psycho-analytical theory, and appeal to the widespread feeling that the neuroses are nothing but unconscious malingering—an element admittedly so common that to handle it vigorously in Adler's way is often sound practice. Yet the reader, if he is familiar with cases in which symptoms are concealed by the patient and do not interfere with his task in life, may decide that Adler's individual psychology is not sufficiently individual, since neurotic symptoms can exist without the aim that he postulates as the foundation of their ætiology and the point of therapeutic attack. Except for more detailed anamnesis and explanation, Adler makes but little advance upon the medical use of morale and exhortation employed by Dejerine at the end of the last century; we can picture him using irony, severity, or kindness to urge the patient towards the renunciation of symptoms, and in this good work his certainty of belief in his own methods must give him an advantage denied to people of less confident temperament. His book will be useful to those who incline towards the methods of explanation and persuasion in the treatment of psychoneurotic disability.

A TEXT-BOOK OF MATERIA MEDICA.

Fifth edition. By HENRY G. GREENISH, D.-ès-Sc., F.I.C., F.L.S., Professor of Pharmacy to the Pharmaceutical Society of Great Britain and in the University of London. London: J. and A. Churchill. 1929. Pp. 561. 25*s.*

IN spite of the now half-forgotten depreciation of Huxley, materia medica has continued to occupy a place in medical study, and even to take on a new attraction as pharmacognosy, the generalised knowledge of such remedial agents as are selected for the purposes of a curriculum. Prof. Greenish's text-book has, for the past 20 years, been included among the really indispensable manuals. In the five years which have elapsed since the issue of the fourth edition, the work has been thoroughly overhauled; the historical introduction has been extended, and several illustrations have been added. The section on animal materia medica is not intended to deal exhaustively with anatomical features, which must be studied in other authorities.

The pattern of the work is clear and easy to follow. For example, if we turn to senna, we find (page 41) its chief constituents, and certain other substances of which the chemical constitution is specified; we are then introduced to several laxative drugs which "form a natural group allied by the similarity of their constituents" owing to the presence of oxymethylanthraquinones. An authoritative generalisation of this kind gives the student confidence; it delivers him from bondage to dry facts, and affords some inkling of the relation between chemical constitution and physiological effect.

INCOMPATIBILITY IN PRESCRIPTIONS AND HOW TO AVOID IT.

New edition, revised and enlarged. By THOMAS STEPHENSON, D.Sc., Ph.C., F.R.S. Edin., F.C.S. Edinburgh: "The Prescriber" Offices. 1929. Pp. 61. 4*s.* 6*d.*

THIS useful handbook first appeared in 1915 as a 32-page pamphlet. A revised edition and several reprints have borne witness to its acceptability, and it has now been subjected to further revision and expansion. The second half of the book, arranged in dictionary form, is easily consulted, and is likely to prevent many mistakes. Few busy prescribers, for instance, would be prepared to name off-hand the substances incompatible with mercurochrome. In a future edition two statements (on pages 47 and 31 respectively) should be modified. The well-known tincture of iodine of the French Codex, 1908, was, by ministerial decree, superseded in 1922 by a "teinture d'iode officinale," containing potassium iodide, and reduced in strength in iodine, and this important change should be made clear. Secondly, recent work by D. B. Dott has disproved the general statement that alkalis decompose acetylsalicylic acid. We find little to criticise in this work which is of proved value.

THE LANCET.

LONDON: SATURDAY, OCTOBER 19, 1929.

THE CHICAGO SURGICAL CONGRESS.

ON Monday last, Oct. 14th, the annual Clinical Congress of the American College of Surgeons was opened, and the proceedings will last throughout the week, while arrangements are outlined extending the time limits of the Congress until Oct. 30th in order to provide an opportunity for the congressists of visiting clinical centres in the environment. No more suitable city in the world exists for holding a massively attended congress than Chicago. Public buildings are on the large scale which characterises the architecture in the capital of the Middle West; the Murphy Hall, a remarkably handsome example of modern florid architecture, makes an excellent centre of reunion; such hospitals as the Wesley Memorial Hospital, the Cook County Hospital, St. Luke's Hospital, and the Montgomery Memorial Hospital afford perfect opportunities for carrying out an extensive clinical programme; while some 20 huge hotels, many of them placed within short walking distance of the headquarters of the Congress, afford accommodation at graded rates for an unlimited number of visitors.

Three addresses will be delivered in plenary congress when members can be accommodated in the ball-room of the Stevens Hotel; one by the new President of the American College of Surgeons, Major-General MERRITTE W. IRELAND, Surgeon-General of the United States Army, ushers in the meeting; one by Dr. GLENN FRANK, President of the University of Wisconsin, is directed to the convocation of Fellows; and a scientific discourse, the Murphy Oration, is delivered by Prof. D. P. D. WILKIE, professor of surgery in the University of Edinburgh, in which he reviews the present position of abdominal surgery. This oration is published in THE LANCET to-day and it is apposite that, in the city where MURPHY was so long a leading figure, the principles which at present prevail in abdominal surgery should be brought to mind. We have here a résumé of knowledge along lines where MURPHY himself made many valuable contributions, for although he traversed the whole field of his art his most fruitful energies were directed towards the improvement of abdominal surgery. MURPHY was gifted alike with remarkably clear vision, a fierce power of concentration, and boundless enthusiasm, and these qualities, which characterise all his work, were nowhere better exemplified than in his early endeavours to extend the range and improve the technique of operative procedure in connexion with the abdomen. MURPHY was one of the pioneers in the brisk and important development of American surgery which became so marked some 20 years ago, and his name occurs among the first Board of Regents of the American College of Surgeons, now engaged in its nineteenth annual session. The College derived much of its initial plan from the constitution of the Royal College of Surgeons of England, and acknowledged this indebtedness by inviting Sir RICKMAN GODLEE, then President of the English College, to be present at its first congregation held on Nov. 13th, 1913, at Chicago. A fundamental difference between the English and the American body is the absence, in the latter case, of strict examinational tests; but an elaborate system of scrutiny has been designed to keep the list of Fellows up to the standards demanded by the College, while the machinery of the College has been used, to great practical advantage, as a lever for securing proper surgical provision at provincial hospitals.

The subjects selected at the Chicago Congress for the operative clinics and demonstrations and the scientific symposia indicate a meeting of general and practical interest upon more or less familiar lines; but ample use is to be made of motion pictures in association with the spread of lymphangitis, with the story of intestinal peristalsis, and other phenomena where these films have been often employed. Pictorial representations also accompany the expositions of difficult labour and cardiac movements, and other communications—such as those upon inguinal hernia and rabies, where pictorial help will be a novelty to most of the audiences. The valuable interest taken by the College in the provision at hospitals of proper accommodation and equipment is represented at the meeting by a conference on hospital standardisation.

THE STOMACH IN PERNICIOUS ANÆMIA.

INTEREST in Addisonian pernicious anæmia has received an impetus during the past few years from the discovery, announced by G. R. MINOT and W. P. MURPHY in 1926, of the successful treatment of the disease by means of liver. Since then various chemical fractions of liver have been isolated, and by their critical employment in the treatment of patients much knowledge has been gained of the changes induced in the patient, and of the nature of the effective principle, which is probably a nitrogenous base. These discoveries have naturally led to further speculation about the essential nature of the disease, and several new hypotheses concerning its causation have been advanced. MEANS and RICHARDSON[1] have reviewed the new facts available, and conclude that the disease must be in some sense a deficiency rather than an infectious, toxic, or neoplastic condition. However, they conclude that it is apparently not in close relation to the already recognised deficiency diseases, since the diet of the great majority of normal individuals will not suffice to relieve the condition once developed. MEANS and RICHARDSON believe that to develop pernicious anæmia some defect of the individual is probably necessary, as well as some defect in the diet. DAVIDSON[2] has reached somewhat similar conclusions, and has considered the liver as the possible site of formation of the effective principle in normal individuals. The attractive simplicity of this idea has appealed to others, notably S. HARRIS and E. SCHWARZ, but the fact that the kidney, and apparently also the stomach, of the pig [3] has been shown to contain the effective substance, makes it difficult to prove that the principle is formed in the liver, or, indeed, in any of these organs. It has, however, been repeatedly observed in the past that the stomach contents of the patient with pernicious anæmia almost invariably show no free hydrochloric

[1] Means, J. H., and Richardson, W.: Jour. Amer. Med. Assoc., 1928, xci., 923.

[2] Davidson, S.: Edin. Med. Jour., 1928, xxxv., 322.

[3] Sturgis, C. C., and Isaacs, R.: Jour. Amer. Med. Assoc., 1929, xciii., 747; Sharp, E.: Ibid., 1929, xciii., 749.

acid. It now appears that under treatment with liver the achlorhydria remains unchanged,[4] though the patient remains well as long as he continues the treatment. HURST [5] has insisted strongly upon the significance of the gastric defect in the causation of the disease. Although much has been written about the absence of hydrochloric acid in the stomach, no particular attention has been given to the possible significance of the lack of ferments accompanying the achlorhydria. Recently, however, the possible importance of the lack of ferments in the stomach of these patients has been brought into prominence by the work of Dr. WILLIAM B. CASTLE[6] of the Harvard Medical School. His observations on patients, carried out in collaboration with Dr. W. C. TOWNSEND, at the Thorndike Memorial Laboratory of the Boston City Hospital, may prove an important contribution to human gastric physiology as well as to the understanding of pernicious anæmia.

From the facts concerning the relationship of the achylia gastrica to the disease, and in view of the circumstance that the improvement of the blood appears to bear a definitely quantitative relationship to the amount of liver consumed, a simple conception of a deficiency mechanism for the causation of the disease was evolved by Dr. CASTLE. He supposed that the secretory defect might be responsible for the failure of a principle necessary for preventing Addisonian anæmia. Accordingly, he decided to test the effect of substituting for the presumably defective digestion in the stomach of the patient the normal gastric activity of a healthy man. This experiment appeared to be feasible, since MINOT and his co-workers had shown that the efficacy of liver extracts can be tested within a few days by estimation of the changes in the number of circulating immature red blood corpuscles (reticulocytes). From a study of some 30 cases of pernicious anæmia CASTLE and TOWNSEND, using this reticulocyte reaction as a criterion, showed that feeding with 200 g. of beef muscle daily for ten days had no effect on patients with pernicious anæmia. On the other hand, if this amount of beef muscle, representing a convenient source of protein, was first eaten by a normal person, recovered by induced vomiting at the end of an hour, and thereafter given daily by stomach-tube to patients with pernicious anæmia, the same improvement in their blood occurred as is regularly produced by somewhat smaller amounts of liver. A precisely similar effect was observed on giving to the anæmic patient 200 g. of beef muscle after incubation in vitro with 300 c.cm. of human gastric juice secreted by normal men following the subcutaneous injection of histamine. The daily administration by stomach-tube of 300 c.cm. of normal human gastric juice was, however, found to be without effect. Apparently a principle capable of acting like liver or kidney was evolved from the interaction of the two individually inert substances, beef muscle and normal human gastric juice, whether combined within the lumen of the stomach or in the incubator. The presence of the beef muscle in the stomach of the patient with pernicious anæmia could apparently produce none of the effective principle; but either within the stomach of the normal man or with normal gastric juice in vitro this substance could be formed. Furthermore, it was found possible to produce the effective substance in the presence of normal gastric juice from beef muscle proteins free from fat and carbohydrate. This, however, could not be done if the gastric juice had previously been heated sufficiently to destroy its enzyme activity, or, curiously enough, if active commercial pepsin (in the presence of hydrochloric acid) instead of normal human gastric juice was used. It is clear, therefore, that hydrochloric acid alone is not responsible for the production of the effects observed.

If, then, the normal stomach can produce from beef muscle a substance effective in relieving the anæmia, it is reasonable to suppose that it could produce this substance in sufficient quantity to prevent the appearance of the disease in the normal individual. On the other hand, the defective stomach of the patient with achylia gastrica might, through a failure to produce this substance, permit the disease to develop. Such are the conclusions drawn by the experimenters, who believe their observations to suggest that the preventive process in the normal stomach is of the nature of an enzyme action upon protein in an acid medium. An obvious objection to the hypothesis is the fact that persistent achlorhydria is stated to occur in individuals who show no other features of pernicious anæmia. Many of these cases, however, can be shown to have only a temporary or an incomplete lack of hydrochloric acid, whereas the reduction of the acid of the stomach contents in the case of Addisonian pernicious anæmia is usually profound, as is also the deficiency of ferments. If CASTLE and TOWNSEND'S observations are substantiated a considerable simplification of the problem will have been achieved, and it will then become possible to focus attention on the causes leading to the gastric defect.

[4] Johansen, A. H.: Ibid., 1929, xcii., 1728.
[5] Hurst, A. F.: THE LANCET, 1923, i., 111.
[6] Castle, W. B., and Locke, E. A.: Jour. Clin. Investigation, 1928, vi., 2; Castle, W. B.: Proc. Roy. Soc. Med., 1929, xxii., 58.

CHRONIC NEPHRITIS AND LEAD POISONING.

MEDICAL practitioners in Brisbane and other parts of Queensland have long held that chronic nephritis terminating fatally in uræmia is more prevalent in that State of the Australian Commonwealth than it is in other parts of the world. That this clinical impression has a strong basis of fact is proved by the statistical study recently published by D. GIFFORD CROLL,[1] who shows that in the ten-year period 1917 to 1926, 1309 persons died of chronic nephritis in Queensland before the age of 40, whereas in the other three States the average number was only 425. Closer analysis of the figures from which these statistics were derived supports the belief that an unknown cause, non-existent or not operative in the other States, was responsible for this strangely high mortality. His paper is followed by a thoughtful contribution by L. J. J. NYE, who endeavours to explain the facts and by close inquiry and reasoning, which is a priori beyond criticism, reaches the conclusion that these cases of nephritis are a late result of lead poisoning in childhood.

The clinical characters of this chronic nephritis in young people appear to be a long hyperpiesis with cardiac hypertrophy and retinal changes in the late stages of the disease, albuminuric retinitis and "choked disc" being frequent. Chronic anæmia lassitude, and gastro-intestinal disturbance are prominent. Œdema is inconspicuous, and renal failure ending in uræmia is the usual conclusion. Examining the question of streptococcal infections in the State, NYE is unable to find any evidence of undue prevalence, and whilst searching for some other

[1] Med. Jour. Australia, 1929, ii., 144.

possible cause, he was struck by the fact that an important proportion of cases of chronic nephritis admitted to the Brisbane General Hospital gave a past history of treatment for lead poisoning. Closer inquiry amongst the group of nephritics without such a history revealed that many of them came from wooden houses where the paint was often dry and in a powdery condition, and that as children they had been devotees of thumb-sucking, nail-biting, or a local pastime which consists in licking the rain-drops from the veranda railings. The investigator then made special inquiry into the renal function of twelve children known to have suffered from lead poisoning, and although in most of these the plumbism had occurred from six to ten years previously, he was able to show that unsuspected chronic nephritis with elevation of blood pressure was present in all of them to a sinister degree.

Without accepting NYE'S conclusions as final until they have been confirmed in a still larger series of cases, it must be accepted that he has made out an excellent case for the consideration of public health authorities in all countries. The prevalence of wooden houses in Queensland and the tendency for paint to crumble and flake in the hot climate make lead poisoning easier than in many countries, but there is perhaps too strong a tendency in England to regard plumbism as a disease which has been practically abolished by modern regulations in the potteries and other dangerous industries. Cases of chronic nephritis in children occur sporadically, and diseases such as renal dwarfism remain unexplained. The incidence of cardiorenal disease in older people continues to a distressing degree, and NYE'S investigations should stimulate inquiry as to whether lead poisoning has been as fully eliminated as is generally imagined.

THE WELFARE OF THE BLIND.

THE League of Nations, in response to a request made by the British Government in 1927, has issued a report [1] on the provisions made by the various Governments of the world for the welfare of the blind. The report is based on a questionaire, replies to which were received from 26 Governments representing all the principal States of the world. A difficulty which appears at the outset of any such inquiry concerns the definition of blindness. Stone blindness, that is to say, lack of perception of light, is comparatively rare, and for practical purposes all countries include in their statistics those with some degree of vision. Many countries, including England, recognise two standards of vision, a higher one for children and a lower one for adults, the standard for children being based on educational needs, that for adults on capacity to use the eyes for work, or on a numerical standard of visual acuity supposed to correspond with this. These standards vary in different countries, and the report recognises that though useful as a guide they are quite unsuitable for rigid enforcement. No universal definition of blindness as a disability is either possible or desirable. This is a fact which of necessity makes accurate comparison between the statistics of blindness in the various countries fallacious. Taking the different categories of the blind with which the report deals, it appears that infantile blindness has been materially reduced owing to the systematic campaign conducted in most countries during the last 20 years against ophthalmia neonatorum. There are, however, still enough blind children under 5 years of age to make it desirable to have a definite policy for their care and welfare. In Switzerland efforts are directed to inform the parents of blind children how best to bring them up. Special nursery schools for these children exist in many countries, including England and Switzerland itself. These nursery or preparatory schools are nearly always in the hands of voluntary societies with or without State grants. With regard to children of school age, in many countries where compulsory education is the rule, blind children are exempted. It is only possible to provide special day schools for the blind in large cities, and apart from them schools for the blind must be residential. Among countries where compulsory education is extended to the blind their education is a subject apart, to which a great deal of attention has rightly been devoted. The leaving age in Great Britain is 16 years; in the United States and elsewhere it is higher, up to a limit of 21 years. The curriculum includes most subjects taught in ordinary schools, with the addition of Braille reading and writing. Various outdoor games are possible, including rowing, and physical culture takes a prominent place in the curriculum. Tests of intelligence are in use both in the United States and in Great Britain. It is important to make special provision for blind children who are also mentally defective. The cost of the education of the blind is borne in varying degrees by the State, public authorities, and voluntary societies. Teachers in blind schools, it is generally recognised, must be specially trained. In Austria and Great Britain they must pass a special examination. The problem of the weak-sighted, such as high myopes, is far from being solved. In Great Britain, the United States, and Canada a beginning has been made by myope or sight-saving schools or classes; for rural districts nothing has even been attempted.

Vocational training generally begins when the period of elementary education is over, but though facilities for this exist in most countries they are not as a rule compulsory. In Great Britain the Blind Persons Act of 1920 requires the local education authorities to secure adequate provision for the technical education of blind persons ordinarily resident in their area who are capable of being benefited by such education, and the statistics for 1927 show that only 1400 out of a total registered blind population of 46,000 had failed to obtain it when suitable. Occupations in which vocational training is given include music, piano-tuning, massage, basket-, brush-, mat-, and mattress-making, chair-caning, sewing and knitting, both hand and machine, poultry farming, gardening, and domestic science. Even when trained, the blind worker remains at an economic disadvantage compared with the sighted worker. Special workshops for the blind provide for a proportion of them, a system which has been most highly developed in Great Britain. Others are organised as home workers with outside help for the provision of materials and disposal of the products. In Germany the experiment is being made of bringing the blind into ordinary factories, setting them to work among sighted workers. In 1920 a Reich law was passed requiring employers to engage a certain percentage (usually 2 per cent.) of war-disabled men, and in 1923 all blind persons, whether war-disabled or not, were included

[1] League of Nations Publications. Health Organisation. III. 8. London: Constable and Co. 10s. 6d.

in this law. The success of this experiment is doubtful, but in a few branches of industry, such as clock-making and the production of small parts for electrical apparatus, it has been signally successful. Similar experiments have been made in England, where, of course, no compulsion exists, but there are several objections to the plan of allowing blind and sighted workers to compete with each other, even where that is possible. In ordinary industrial occupations the output of a blind worker is less than that of a competent sighted worker, by an amount variously estimated as 25 to 66 per cent., and in order that the former may earn a living wage additional payments known as "augmentation" are made to him in most countries, either from State or from voluntary funds. Numerically larger is the problem of the unemployable blind. In most countries it is dealt with by the poor-law organisation. In America the practice varies in the several States. In Great Britain, under the Blind Persons Act, the certified blind receive their old age pensions at the age of 50, and by the Local Government Act of 1929 the local authorities will have power to grant relief to poor blind persons under 50, apart from the poor-law. All these services involve a great expenditure. In England and Wales it was estimated to amount to £1,250,000 in 1924–25, of which £420,000 was contributed by voluntary societies and the balance partly by the State and partly by local authorities.

The sixtieth report of the National Institute for the Blind gives an encouraging summary of the position of the blind, so far as England is concerned. The work of the Institute is threefold: first, the organisation and allocation of charitable funds so as to avoid waste and overlapping; secondly, undertakings directly for the benefit of the blind—the publication of books and music in Braille type, the provision of homes for blind babies (the recent fire at Chorley Wood Sunshine House necessitated moving the children into Devon pending the rebuilding), the maintenance of various other schools, homes, and hostels—personal services to the blind, including the distribution of wireless sets; and thirdly, research into new openings for blind workers both in manual and non-manual occupations. Efforts are being made to increase the openings in those professions which a limited number of blind persons already practise. The Advisory Committee on the Welfare of the Blind is considering the question of promoting the further education of the adult blind by means of correspondence. Courses were organised by voluntary effort last year, and requests have been received for instruction in such subjects as English composition and literature, business correspondence, history, French, German, Latin, industrial history, and the theory of music. Such courses are likely to broaden the interest and outlook of blind persons in all phases of life and human activity. Those who are interested are asked to send in their names to the secretary of the voluntary association to which they are attached, or to their home visitor.

THE RADIUM COMMISSION.

AT a meeting of the Commission on Oct. 11th it was decided to allot the four-gramme bomb of radium to the authorities of the Westminster Hospital, subject to agreement on the conditions of the loan. This bomb has been secured by the National Radium Trust for a period of three months from Nov. 1st, with an option to purchase at the end of that time. The Commission's policy of selection is based on the principle of concentration of radium at a limited number of centres in Great Britain, to which patients will be brought for treatment. At the same time it is proposed to distribute under proper safeguards supplies of radium emanation, prepared under the direction of the Commission.

Annotations.

"Ne quid nimis."

A STATIONARY POPULATION.

"WE are," says Sir George Newman in his annual report for 1928, "almost within sight of a stationary population" and the press and the public seem at last to be taking notice of a prospect of which they have been assured for the last ten years by Prof. A. L. Bowley, Prof. Raymond Pearl, and other statisticians. The population of this country was about 9 millions in 1800, 18 millions in 1850, 32 millions in 1900, 36 millions in 1910, and 40 millions now. The increase during the nineteenth century was unprecedented; from about 5 millions in 1600 the number of the people slowly grew to some 6 millions in 1700, and we have every reason to suppose that we are now returning to the almost stationary condition of the seventeenth century. Elderly and middle-aged people to-day were brought up in an atmosphere of rapid increase and universal expansion derived from their own experience of what was going on around them and from the literature of the preceding generation. What was to them the obvious fact that there were yearly more and more people, that towns were ever growing larger, that more and more public buildings were needed necessarily coloured their whole outlook on life, and their attitude towards social questions which has been passed on to those who are at present young has much the same complexion. It will need something of a mental convulsion to realise in all its implications that no further considerable increase of population is to be anticipated, feared, or hoped for, as the case may be. And it is difficult to see quite plainly what the change will involve though it is obviously of extraordinary importance.

Sanitarians will be concerned with migrations of populations rather than with changes in total numbers. No one can foretell how far the urbanisation of rural people will continue. Towns maybe will stop growing altogether and town-planning schemes will stay in the cupboard. The speculative builder will grow cautious, perhaps not till over-building has produced a useful decline in house prices and rents. Generous schemes of water-supply, sewage disposal, and other public services will suffice. Above all, sanitary authorities will have a breathing space in which they can make their equipment more nearly perfect without the immanent nightmare of unmanageable growth.

But in one important respect the stationary population of the twentieth century will be very different from that of the seventeenth. Numbers rose little between 1600 and 1700 because the death-rate was so high; they will increase only slightly between 1929 and 2000 because the birth-rate is so low. The average expectation of life at birth has enormously increased and the population of 1950 will differ from that of 1750 by containing a much larger proportion of old people. It is not our concern at the moment to discuss the effect of this on industry, production, and consumption; its medical implications are enough. Man's body in Western Europe nowadays begins to decay somewhere about 35; his elastic tissue loses its elasticity, he tends to become generally fibrous, his aorta begins to die and dilate, the glomeruli of his kidney perish a few at a time, his functional defects are obvious if he tries to run. And there is no suggestion that in increasing the average length of life anything has been done towards extending life's maximum possible duration; death at the end of the natural span is postponed, not averted, and the human body is where it has always been since vital statistics were collected. It follows that medicine and surgery will, progressively more and more, have to conduct their operations on bodies which are more or less decayed and senile. It is estimated that one-fifth of the whole population will

soon be aged 55 years or over, which means that their bodies will have but an indifferent capacity of healing themselves and doing anything which involves cell growth. Medical men will spend more of their time in helping lame dogs over stiles; in its mercy civilisation is learning to put up fewer and fewer obstacles.

AYERZA'S SYNDROME.

THERE are two chief reasons or excuses for attaching a man's name to a particular disease or syndrome—one that he was the first to describe or called particular attention to it, the other that the use of a single name provides an escape from the use of a cumbersome phrase. These two reasons are often combined as they are in the case of Ayerza's disease (better called syndrome). Further, it often happens that a syndrome which appears clear-cut when first published is found to include a number of unrelated pathological conditions, and as time passes and additional similar or related cases are brought to light it becomes increasingly hard to define. At this stage, if it is to serve any useful purpose, its use should be limited to those cases which had escaped previous recognition or else to those which have distinguishing clinical or pathological features. The chief feature of the cases to which the term Ayerza's syndrome has been applied is a severe cyanosis developing secondarily to disease starting in the respiratory system. Associated with the disease of the lungs changes in the pulmonary arteries, atheroma, thrombosis, endarteritis, and hypertrophy of the right side of the heart were found.

Before Ayerza's teaching was made known by his students' publications it was recognised that many respiratory diseases, notably chronic bronchitis and emphysema, asthma, and tuberculosis might, and not infrequently did, terminate with severe cyanosis, following failure of a hypertrophied right heart and changes in the pulmonary arteries. It therefore seems unnecessary to introduce a new term for this familiar association. There remain, however, the rarer cases in which the primary lesion is in the pulmonary arteries themselves and for these a distinctive name might be advantageous. It is in drawing attention to this group of cases that Ayerza, his pupils, and subsequent writers have performed their chief service; the accounts of primary lung diseases, with secondary changes in pulmonary vessels, included in their papers have only obscured the value of their contributions. In 1926 Escudero, one of Ayerza's pupils, affirmed that there were two stages in the production of the syndrome: one bronchial, syphilitic bronchitis; and the other secondary to this, a degeneration of pulmonary arteries. This would limit the group to one in which the pathological basis consisted of syphilis of lung and either syphilitic inflammation or secondary degeneration of the pulmonary arteries. Arrillaga in 1913 had recognised the association with syphilis, but had only regarded it as playing the part of a sensitising adjuvant to chronic pulmonary disease such as chronic bronchitis and emphysema. Although it will differ markedly from the earlier conceptions and will be broader than that put forward by Escudero, it will be useful to suggest the limits of the syndrome as it is now emerging. In this sense it would be limited in its application to cases of severe cyanosis associated with diseases of the pulmonary arteries and right-sided cardiac hypertrophy in which primary lung and heart lesions can be excluded. In addition to the cyanosis, other signs of chronic venous engorgement and heart failure, such as dyspnœa, polycythæmia, œdema, and hæmoptysis, would contribute their quota to the clinical picture.

Of these primary diseases of the pulmonary artery only two kinds have been described so far, one due to primary atheroma with thrombosis, and the other syphilitic. Neither is common, and of the two so far reported the syphilitic cases have been twice as numerous as the atheromatous. It is possible that as the condition becomes better known other causes connected with such diseases as rheumatism or periarteritis nodosa may be added to them. As it is, taking the syphilitic and atheromatous together a sufficient number have been published to enable Dr. Dorothy Hare and Dr. Joan Ross to collect 23 cases to which they add another in the paper published on p. 806; whilst a further case not included in their list was contributed by Dr. Konstam to our last issue. It seems evident that cases are accumulating and are sufficiently distinctive and important to merit description and a label. Konstam evidently regards his as an example of Ayerza's syndrome; Hare and Ross, on the other hand, suggest that theirs is not. The two cases are nevertheless very similar. Each provided definite evidence of syphilis apart from the lesions in the lungs; each had a positive Wassermann reaction. The lesions in the smaller and the secondary atheroma in the larger pulmonary arteries, together with the fibrosis of the lungs and right heart hypertrophy, were so similar that although Prof. H. M. Turnbull (in Konstam's case) describes a more fibrotic and Dr. Ross a more cellular reaction they must be accepted as phases in the same process. Both cases would fit quite comfortably into the syndrome as defined above. Hare and Ross would probably, and quite legitimately, object that in the first descriptions of Ayerza's syndrome the chronic pulmonary disorders were regarded as primary and therefore we have not defined Ayerza's syndrome. As has already been explained, the chronic lesions of the lung with secondary pulmonary artery and cardiac changes are very numerous, many of them unrelated and were well known before Ayerza's teaching became public. The 23 cases collected by Hare and Ross, together with their own and that of Konstam, do form a definite group and are characterised by an equally clear clinical picture giving the necessary basis for a syndrome. Are we to call it Ayerza's when there are other authors who appear to have much stronger claims to the distinction of having it called after them? It would be easy to suggest alternative titles, but names creep insidiously into medical nosology and once established are very difficult to eradicate. Whether "Ayerza's syndrome" is so established or not it is impossible to say. In any case as first used it would be much better dropped, and if this is impossible it would, though illogical, be far better to confine its use to the only clear-cut syndrome which has emerged from the nebulous, ill-defined, and confused conceptions which first appeared.

AN ATTEMPT TO IMPROVE DOMESTIC DIET.

Mr. H. L. Mencken somewhere argues that American women provide shocking meals because they are too intelligent to bother about food. The Cattaraugus County Board of Health, on the other hand, attributes their shortcomings to ignorance, and in 1924 it appointed Miss R. M. Odell[1] as nutritionist in the hope that she would bring the findings of the laboratory and the clinician into daily life. An investigation into the food habits of the people was started by the study of school medical records and by a questionaire of representative homes. The latter inquiry was undertaken through the local groups of home bureau women (corresponding to our women's institutes) so as to obviate the natural resentment of the families to apparently impertinent questions from an outsider. Groups were selected from (1) professional workers, (2) town labourers, and (3) farmers, and their food intake was analysed for a week. Various groups were thus examined over a period of 12 months so as to avoid seasonal considerations, and it was found that in the rural districts there was a lack of green vegetables in the diet. The people were therefore stimulated into planting gardens, and

[1] Improving the Dietary Habits of a Rural Community. By Ruby M. Odell. Millbank Memorial Fund, New York.

demonstrations were given for the storage of vegetables for the winter.

Three types of activity were based on this survey—namely, consultative service to individuals, adult education, and a school health programme. The desirability of the teaching is suggested by a case referred to the nutritionist in which the food of the family was "fried pork three times a day, fried potatoes twice a day, bread, butter, and cake. No milk was used." Most of Miss Odell's time was taken up in group education, as doing more good in a short time. Mothers, women's clubs, and other local groups were gathered together by the public nurse, and health talks and advice were given to them. In addition, a number of short courses on dietetics were held for representative groups of rural women. All-day conferences were held with the nutrition worker, and the representatives returned to their districts and retailed the knowledge to their fellows. There were also courses for the teacher-training classes, and individual teachers were instructed in the art of preparing a hot dish daily to supplement the cold lunch brought by the children. At individual schools health games and talks to the children were instituted. "Follow-through" work was undertaken, and it was found that the family diets of the district had improved. An excellent method was devised in which local shopkeepers were asked about alterations in orders given before and after the period of nutritional education. One merchant stated that he sold a carload of cabbages each week, whereas previously it had taken him a month to dispose of the same amount. This is typical of the findings with the other 55 storekeepers questioned.

THE CULTIVATION OF CINCHONA BARK.

THE League of Nations has recently given wide publicity to the fact, shown in India many years ago, that the total alkaloids of cinchona, purified so far only as to exclude unpleasantly toxic constituents, are as effective weight for weight against malaria as is quinine. The logical conclusion is that to extract quinine and use it alone is a waste of time and money and a squandering of antimalarial resources. Dr. J. M. Cowan [1] writes that the average percentage yield in India from the various cinchona barks respectively of quinine and of the other alkaloids is as follows: *C. ledgeriana*, 5·49 and 3·03; *C. officinalis*, 2·93 and 2·07; and *C. succirubra*, 1·4 and 4·85. The appearance of Cowan's paper is opportune, for the hopes that in plasmochin an effective and safe substitute for quinine had been found have not been realised. It is generally agreed that plasmochin has little action except on gametocytes, and particularly on those of subtertian malaria, the well known crescents. Accordingly plasmochin is now being given more and more in the form of tablets of plasmochin compound which, it bears emphasis, contain quinine, enough indeed to have prompted the published report that they have produced cinchonism. Moreover, while plasmochin does not necessarily render a man harmless to his fellows, its risk to himself is definite. J. A. Sinton and W. Bird [2] pointed out more than a year ago that three deaths had occurred in less than 1000 reported cases, while instances of non-fatal poisoning have been of frequent occurrence, grave symptoms appearing without warning. There is thus a preponderant weight of opinion which holds that no one should take plasmochin who is not under close daily medical supervision. The drug cannot then take the place of quinine in mass treatment, cannot be sold to all comers as quinine is sold, and when given should be given with quinine, which remains the essential factor in any war against malaria. Cowan points out that it is estimated by Müller, of Cologne, that 800,000,000 persons suffer from malaria; by Ronald Ross that 2,000,000 of them die yearly; and by Andrew Balfour that the annual loss which malaria inflicts on the British Empire is over £50,000,000. Clearly a problem of this immensity can be attacked only by the Governments of the peoples concerned. If proof were required of the need for State action it could be found in the fact that 40 years ago the fall in price of quinine crushed out of existence the many cinchona plantations which existed in India and Ceylon at that time. Nine-tenths of the world's supply of bark comes from Java. The growers there are then in a position to distribute merely as much alkaloid as will keep the price profitably raised, so that the world shortage of quinine is really an expression of a general inability to pay the price asked, while had not the price been raised cultivation could not have been continued. This is clearly an instance where human life and the profit necessary for ordinary commercial production are in opposite scales. Although India produces a third only of the quinine she consumes, she is yet the most forward grower of cinchona within the Empire. Yet there must be other districts within the confines of the Empire (Cowan mentions Malaya, Tanganyika, and parts of India itself) where cinchona could be grown, for its cultivation is long past the experimental stage. Its requirements are certainly fastidious: a mean temperature of about 75° F., some shade, a rainfall of 75 to 180 in., an altitude of between 1000 to 5000 feet with likelihood of a poor percentage of alkaloids near the lower limits, and a terrain which has been covered with evergreen forest growing on a rich porous, well-drained soil overlying sloping granite or volcanic rock. The trees are finally uprooted after growing for ten years. They have, however, rendered the soil, at least temporarily, incapable of producing a satisfactory second crop; but investigation may show that fallowing in forest for 15 to 20 years between crops is unnecessary, since in Java scions of *C. ledgeriana* grafted on *C. succirubra* stock have permitted of replanting at a shorter interval. While then research must be continuous, Cowan's paper leaves little doubt that a coördinated, Empire-wide scheme for the planting of cinchona and the harvesting of its alkaloids is not merely forced on us by consideration for the Empire's tropical inhabitants, but will repay the cost many times over.

[1] Empire Forestry Jour., 1929, vol. viii., No. 1.
[2] Indian Jour. Med. Res., 1928, xvi., 159.

DRESSINGS AFTER VACCINATION.

THE attention focused on post-vaccinal encephalitis has been allowed to divert interest from a more practical question—namely, how is normal routine vaccination best performed? Now that the number of scarified areas has been reduced we are left with an outstanding difference of opinion about the proper dressing to apply. A popular commercial one consists of a celluloid box cover; bunion pads are also often used; and probably most medical men employ a piece of gauze with adhesive strapping. None of these is really satisfactory, and the practice of leaving the lesion uncovered, while theoretically making secondary implantation of the virus in undesirable sites more likely, has much to recommend it, at any rate, when there is any chance of infection by tetanus. Thus C. Armstrong [1] shows that 116 collected cases of post-vaccinal tetanus in the United States were all in persons treated by various forms of dressings, no less than 53 occurring when the celluloid box method had been used. Cases due to such causes as infected scarifiers were omitted from the series. He holds that the congestion, moisture, and relatively anaerobic conditions promoted by the dressing must encourage the growth of the tetanus spores. Their source is uncertain, for vaccine lymph has never been shown to contain them, and the possibility of blood-stream infection, though it certainly arises owing to the known presence of tetanus spores in the human intestine, is not very great. Experiments on rabbits and other

[1] Public Health Reports, 1929, xliv., 1871.

animals indicate the greater facility with which tetanus can be imposed on vaccinia when the lesions are covered with a dressing, and also when the virus is inserted by intradermal injection. Post-vaccinal tetanus is, of course, very rare in this country, but the problem of the appropriate dressing is none the less important, since severe "takes" are definitely stated to be more common when the lesions are covered. Armstrong, it may be noted, recommends vaccination by the "multiple pressure" method of J. P. Leake,[2] and holds that there should be no dressing, or at most only a loose sleeve.

ANOTHER ANÆSTHETIC FOR CHILDBIRTH.

BARBITURIC acid derivatives have been used as anæsthetics or analgesics in France, where somnifen (allyl-isopropyl barbiturate) has had a certain vogue, and in Germany, where Bumm introduced pernokton, a brom-propyl-phenyl barbiturate. Somnifen has been used both intravenously and intramuscularly in labour, but has been condemned by some as causing drowsiness in the child and extreme restlessness in the mother. The progress of labour was also held to be impaired. The latest drug of this kind to be employed is sodium iso-amylethyl barbiturate,[3] and after extensive trial on animals a hundred cases of labour have been conducted with its aid. It was given intramuscularly after an injection of morphine and scopolamine when uterine contractions were occurring at intervals of less than ten minutes. Later intravenous injections were given. It is stated that labour was rendered almost painless without any evidence of harm to the mother, that danger to the baby has not been proved, and that prompt and complete control of eclamptic convulsions is possible. The most serious objection to the use of sodium amytal was the difficulty in restraining patients who became very restless. The drug is rapid in action and has a wide range of safe dosage.

CAISSON DISEASE IN THE LIFFEY TUNNEL.

CAISSON disease is caused by liberation of nitrogen bubbles from the blood into the tissues when a tunnel worker or diver passes too quickly into the normal atmosphere from a zone of high pressure. It is usually avoided by allowing the workman to pass through a chamber or "lock" in which decompression takes place gradually, but Dr. F. J. O'Donnell [4] relates that no less than 25 of 69 men employed during 11 months at the tunnel face in the Liffey Tunnel at Dublin suffered from "bends," as the symptoms are commonly called. One of them developed organic paraplegia, due to nitrogenous bubbling and coalescence in the fatty and vascular structures in the lower dorsal spine, and three presented intractable joint and visceral pain unfitting them for further work of the kind. In ten cases severe disablement was avoided only by immediate recompression, and there were 11 cases of arthralgia, vertigo, headache, and cramp. From a study of this high morbidity and of the men who escaped it, Dr. O'Donnell has come to the conclusion that damp and cold greatly add to the risk of the disease; in a warm dry site, he says, no cases should occur with pressures up to 30 lb. per square inch, provided that decompression is gradual. He holds that shifts should be shorter, the longest period which should be passed in "air" being not more than three hours. Extra clothing and stimulant drinks should be available during and immediately after decompression, and workers should not quit the vicinity of the decompression lock till they have been free from all abnormal sensations for fully half an hour. Men with a systolic blood pressure of over 140 are unsuitable for training in work under high pressures and should be rejected as recruits, but individual susceptibility to "air" varies considerably and apparently cannot be foretold by any device, so that newcomers should be tested in an air-lock on the surface or given graduated shifts. A complaint of itchiness of the skin among seasoned and experienced workmen who feel no other ill-effects is a sign that they have been exposed as long as is advisable and they should be given a short rest.

[2] Ibid., 1927, xlii., 221; see also THE LANCET, 1927, i., 671.

[3] Robbins, A. R., McCallum, J. T. C., Mendenhall, A. M., and Zerfas, L. G.: Amer. Jour. Obst. and Gyn., Sept., 1929, p. 406; see also THE LANCET, Oct. 5th, p. 730.

[4] Irish Jour. Med. Sci., 1929, xlv., 618.

SMOKE ABATEMENT.

AT a conference recently held in Buxton a fusion took place of the societies known as Coal Smoke Abatement Society and the Smoke Abatement League of Great Britain, under the presidency of Dr. H. A. des Vœux. It had been recognised for many years that concentration of the work in one body was advisable in order to save duplication of effort and dissipation of energy. Certain difficulties which stood in the way have now been overcome and there is every hope that the formation of a National Smoke Abatement Society will secure the diminution of the clouds of smoke which are so evident to any traveller by train or road and especially by air. We trust that one of the first tasks undertaken by the Society will be to impress strongly on all sanitary authorities the importance of applying the by-laws which can now be made under the Smoke Abatement Act of 1926. We understand that of all the authorities in the country only between 70 and 80 have as yet applied to the Ministry of Health for sanction for by-laws, and of these many govern small and unimportant districts where the nuisance from smoke is little felt. The Smoke Abatement Act, although not drastic enough to satisfy enthusiasts, admits of progress in the right direction, and the Ministry has circulated to all authorities a model by-law which fixes the standard time for the permissible emission of black smoke as two minutes in half an hour. The wording of this model by-law is as follows:—

"Whereas Section 2 of the Public Health (Smoke Abatement) Act, 1926, provides that any local authority may make by-laws regulating the emission of smoke of such colour density or content as may be prescribed by the by-laws and that where such by-laws are in force the emission of smoke of the character so prescribed for such period as may be prescribed in the by-laws either from buildings generally to which the enactments relating to smoke nuisances apply or from any such classes of those buildings as may be so prescribed shall until the contrary is proved be presumed to be a nuisance:—

"The Mayor Aldermen and Burgesses of the Borough of X, acting by the Council (or, as the case may be, the Urban or Rural District Council of Y or Z) do by this by-law prescribe that the emission of black smoke for a period of two minutes in the aggregate within any continuous period of thirty minutes from any one chimney in a building other than a private dwelling-house shall until the contrary is proved be presumed to be a nuisance."

The advantage of such a by-law is that a sanitary authority can, through its inspector, go into a court of justice and give evidence that black smoke has been emitted for a period of two minutes in the aggregate in half an hour. This simple procedure can now be adopted by all sanitary authorities throughout the Kingdom, and if faithfully and determinedly followed should do much to mitigate the smoke nuisance of factory towns and districts. The knowledge that such power exists will doubtless educate owners of factories to a proper sense of their duties to other citizens, and it is hoped that few prosecutions will be necessary. The Ministry of Health has so far not allowed any by-law dealing with smoke other than black smoke. But although it is incontestable that atmospheric pollution is most intense where factories exist, a considerable proportion of smoke does come from domestic chimneys, and much work remains to be done in stimulating the demand for smokeless methods of heating the

home. This at present can only be a voluntary effort, for private dwelling houses are expressly exempted by all Acts so far passed by Parliament. In the 1926 Act permission is given to local authorities to unite with adjoining authorities to form statutory bodies for carrying out the provisions of the Act. Several such bodies have been formed. Two years ago, at the instigation of the Coal Smoke Abatement Society, 90 of the local authorities in and about London held a conference at the Guildhall which was addressed by Mr. Neville Chamberlain, the Minister of Health then in office. The conference appointed a committee to draw up recommendations to secure uniformity of administration of the Smoke Abatement Acts, and this committee on Oct. 15th brought its recommendations to the conference. Some of these recommendations were presented to the conference held in Buxton this month and have become an accepted part of the policy of the newly formed National Smoke Abatement Society.

GAS GANGRENE IN THE AMERICAN ARMY.

THERE were 2718 cases of gas gangrene, 1267 of them being fatal, among the 224,080 American soldiers wounded during the war on the Western front. This incidence of roughly one case of gas gangrene per cent. of the wounded, with a mortality-rate up to 50 per cent. of the cases, is consistent with the records of the British, French, and German medical services. The Americans on taking the field had the advantage of the considerable research already done by the other belligerents on the prevention of anaerobic infection. To counterbalance this, however, they found themselves for the most part fighting in a terrain which had been richly manured for centuries, and was thickly strewn with human and animal organic matter as a result of several years of intense stationary warfare. In Volume XII. of the archives of the Medical Department of the United States Army in the World War [1] a fully illustrated account of gas gangrene, as it affected the American army, is set out. It is interesting to compare the account of its pathology with that given in the first volume of the System of Bacteriology recently published by the Medical Research Council, which is also based largely on the experience gained during the war of this infection. In the American work gas gangrene is considered under two headings. First the virulent forms are described and subdivided into emphysematous, toxic-œdematous, mixed and putrefactive types. The illustrations provide a comprehensive atlas of the pathology and histology of these states. Secondly, an avirulent form is recognised and described, in which the infection tends to resemble in time a bronze-like erysipelas and has a good prognosis. The bacteriological descriptions are mostly concerned with the four anaerobes *B. welchii*, *Vibrion septique*, *B. œdematiens*, and *B. histolyticus*. *B. welchii* naturally receives most consideration. It is stated to be not a true parasite, but a saprophyte incapable of growth in healthy tissue, and able to thrive only if the body cells are first injured by some mechanical or chemical means. Its lesions are said to involve the muscles, the blood-vessels, and the subcutaneous connective tissues. On this point American views differ from those held in Great Britain, where the site of the local lesion is not regarded as of supreme importance. In a Medical Research Council report published in 1919 [2] it is suggested, as the outcome of experimental infections, that the localisation of the infection in muscle is purely an accidental phenomenon, since the organism does not grow more readily in muscle than elsewhere. On the other hand, the importance of septicæmia with visceral dissemination is emphasised. Two small matters emerging from the American survey are at least of retrospective interest. The first concerns "laudable pus" which military surgeons in former times greeted with enthusiasm as of good prognostic significance; it is recorded that pyogenic organisms, with certain exceptions, though they might not alter the general outlook for the patient, yet tended to inhibit the growth of the gas gangrene organisms. The second concerns scabies. It was noticed that the burrow of the female provided an ideal and much-frequented culture tube for the anaerobes.

[1] Washington: U.S. Government Printing Office. 1929. Pp. 583. $3.60.

[2] Reports of the Committee upon Anaerobic Bacteria and Infections. Medical Research Council, Special Report Series No. 39. H.M. Stationery Office. 1919.

THE annual dinner of the Royal Society of Medicine will be held at the May Fair Hotel, Berkeley-square, London, W., on Thursday, Nov. 21st, at 7.30 for 8 P.M. The Prime Minister, the Minister of Health, and the French Ambassador have consented to be the Society's guests of honour.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XLVIII.

THE DIAGNOSIS OF GONORRHŒAL INFECTIONS IN THE MALE.

THE bacteriologist can give considerable help in the diagnosis of gonococcal infections in spite of the elusive tendencies of the gonococcus. It is proposed here to deal solely with microscopical and serological tests in the male.

Collection of Specimens.

The more important points in the collection of specimens deserve attention. First, in order to make sure that the pus is coming from the meatus and that the condition is not one simply of balanitis, all pus surrounding the meatus and preputial sac should be wiped away. Then the patient should be instructed to squeeze up the pus from the base of the urethra. The pus is collected on one or preferably two swabs (one for films and the other for cultures). If more than a few minutes is likely to elapse before the swabs reach the bacteriologist it is advisable to make a couple of films from one of the swabs straight away. If delay is unavoidable, it is important to see that the tubes into which the swabs are placed are properly corked to prevent drying up. A thinnish film of even consistency is to be aimed at, and some prefer to use a platinum loop for this procedure.

When cultures are desired it is preferable for the patient to attend the laboratory, for the material must be inoculated and incubated immediately. The gonococcus very soon dies out at room temperature. Cultures should always be made in medico-legal cases. Ordinary agar is useless for this purpose, and the best medium is hydrocele fluid agar.

Examination of the centrifuged deposit of urine is valuable in the later stages when the discharge has disappeared. The urine should be held for at least four hours and then passed direct into one or more sterile wide-mouthed bottles, care being taken: (*a*) thoroughly to cleanse the meatus with spirit and allow it to dry off; (*b*) to cork the bottle immediately it is full; (*c*) to send the specimen to the laboratory for immediate examination. If the material is not examined at once contaminating organisms will probably multiply and obscure the result. Furthermore, pus cells if few in number are apt to disintegrate and become unrecognisable.

In collecting a specimen following prostatic massage the patient is instructed to retain his urine for three or four hours and the meatus is then cleansed with spirit. After this the prostate should be massaged and any secretion coming away from the meatus can be collected direct on to a slide, which is put aside to dry in the air. The patient then empties his bladder into two or three wide-mouthed sterile bottles. This washes out the secretions and any pus that may be present, and these are eventually recovered in the laboratory by means of the centrifuge.

It must be emphasised that the gonococcus in vitro is a delicate organism. For this reason specimens of urine and prostatic fluid sent to the laboratory for examination should be as fresh as possible. In the later stages of the disease when the gonococcus becomes more and more difficult to find, it is liable to appear only intermittently in the discharges and in urine. To overcome this difficulty provocative measures may be employed. A discharge may be deliberately provoked by irritation of the urethra. The following methods have been adopted for achieving this: the passage of an instrument; the instillation of silver nitrate into the posterior urethra; the use of a provocative injection of gonococcal vaccine, and hard physical exercise and alcohol.

Bacterial and Cellular Elements.

In the interpretation of reports on material sent at various stages of the disease it must be remembered that during the first few hours of the infection gonococci may be scanty in the discharge, but very soon they appear in large numbers and can be identified with considerable ease. It is not long, however, before secondary infection takes place, and it is a rule for one or more of the following organisms to appear with the gonococcus: staphylococcus (usually albus), diphtheroid bacilli, enterococcus, *B. coli*. These organisms are probably mildly pathogenic and help to keep up the infective process, for they are found in chronic cases when the presence of the gonococcus can no longer be established. *B. coli* is not so common as the rest, but when it does occur it may prove very resistant to treatment. The distinction between a secondary and a primary *B. coli* infection can only be made by a study of the history in those cases where gonococci have not been found in the early stages.

Apart from bacteria in the pus, information of importance can be obtained from the cellular content. In the early days of an attack 90 per cent. or more of the cells are polymorphonuclears, the remaining 10 per cent. or so consisting chiefly of desquamated epithelial cells. This proportion lasts for a considerable time, and it is only when the infection is approaching its termination that the percentage of epithelial cells rises and the polymorphonuclears disappear.

While there are still polymorphonuclears to be found in the centrifuged deposit of urine, treatment should be continued. It is by no means uncommon to receive a specimen of urine or a smear from an old chronic case, and the only information demanded is "? presence of gonococci." Cases of this sort make one suspect that too much importance is apt to be placed by some practitioners on the presence or absence of gonococci and not sufficient attention on the presence of pus cells and secondary organisms. It does not seem unreasonable to aim at getting the centrifuged deposit of urine entirely free from pus cells as well as from gonococci and secondary organisms after prostatic massage and the various provocative methods have been applied, but this standard of cure is admittedly a high one.

The Complement-fixation Test.

Within certain limits this test has value in the diagnosis of gonorrhœal infections, though its value and reliability cannot be compared to the Wassermann reaction in the diagnosis of syphilis. The test depends on the detection in the blood of a complement fixing antibody, and the chief limitation of the test with the technique at present employed is the low concentration of the antibody in the serum. Owing to this some cases of undoubted gonorrhœa give a negative test throughout. However, it is possible that in the future, with improved technique, this disadvantage may be overcome.

The importance of the test at present lies in its specificity. Of 100 specimens of bloods from people who gave no history of gonorrhœal infection which were tested in this laboratory a few years ago, only two gave anything approaching a positive result. These exceptions occurred in patients attending the V.D. clinic for syphilis, and so there is just a possibility that the histories given to us by the patient were not correct. A positive result, especially if it is supported by a possible history or clinical symptoms, can be taken as very strong evidence in favour of a gonococcal infection. The reaction does not usually become positive until the disease is approaching the chronic stage, and a positive result can only be expected in somewhere between 50 and 80 per cent. of cases. The highest percentage of positive reactions is to be found in cases with complications such as pyosalpinx, arthritis, iritis, and the chief value of the test lies in the diagnosis of the nature of these conditions. About 2 c.cm. of blood are required for the test, preferably obtained from a vein, owing to the importance of keeping it sterile. The test cannot be performed in blood contaminated with bacteria. It is important to note that the test has no value in cases which have received vaccine treatment.

Tests of Cure.

In some cases it is exceedingly difficult to decide whether a patient who has been suffering from a chronic gonococcal infection is cured or not. Before a decision is arrived at the patient should be tested on at least three different occasions, and only if negative results have been consistently obtained should he be considered free from infection. It is unwise ever to accept one negative report as conclusive evidence of cure, and two out of the three tests should have been made after the use of a provocative measure. The ideal aimed at in treatment is the complete disappearance of not only gonococci but also of pus cells from the secretions. Unfortunately, this ideal cannot always be achieved. Even after prolonged treatment the prostatic fluid and urine may still contain a certain amount of pus, and the question arises as to whether such a patient should still continue under treatment. Some authorities are willing to overlook the presence of a few pus cells in these cases and discharge the patient, whereas others are not prepared to go so far. The question is undoubtedly one of considerable difficulty, since the fear must always exist at the back of the practitioner's mind that gonococci are still present, although undiscovered by the pathologist. Certainly in some of these cases the inflammatory process is kept up partly owing to the irritation of the antiseptics employed and the condition may clear up on the cessation of treatment.

The complement-fixation test has proved to be of little value as a test of cure in gonorrhœa, and is seldom employed at the present day for this purpose. Various continental authorities have recommended the use of spermo culture, and have reported that it has frequently yielded positive results when other attempts to find gonococcus have been negative, but the majority of patients will object to the carrying out of this test, and it is seldom used in England.

A. B. ROSHER, M.R.C.S., D.P.H. Lond.,
Director of the Charing Cross Hospital Institute of Pathology.

THE WEIR HOSPITAL.—The report of this Balham hospital for 1928 shows that there were 633 in-patients and 19,627 out-patients, the figures including 10,106 casualties. The X ray department is to be enlarged as soon as means permit.

Special Articles.

THE RELATIONSHIP OF CORONER AND MEDICAL PROFESSION.

A Lecture delivered to Post-graduates, at the Manchester Royal Infirmary on Oct. 11th, 1929,

By C. W. W. SURRIDGE,
H.M. CORONER FOR THE CITY OF MANCHESTER.

I SHOULD like at the outset to point out that the coroner is an independent official. He is not a police official, and within certain limitations he has a wide discretion and a heavy responsibility. He is not bound by the laws of evidence, although in criminal matters, in my opinion, he should strictly observe them. The practice and procedure varies amongst different coroners, and I am only speaking of my own practice and procedure.

A coroner can only act upon information. In all cases where a crime is concerned, or serious accident, he usually gets his information immediately from the police, but in a very large number of cases the police are not called in, and it is from the doctors that the coroner derives his information, or from the registrar, whose duty it is to scrutinise closely the doctor's certificates, and to refer them to the coroner if he is unable to accept them.

Obligation to Inform.

There is no statutory obligation upon a doctor to inform the coroner, though it is said to be his common law duty, as one of those about the deceased, to inform the coroner or his officer, or the police, where he has any reason to suppose an inquest may be necessary.

But although there is no statutory duty upon a doctor to inform the coroner, it is, in this city at any rate, an unwritten law of courtesy for the doctor to inform the coroner at the earliest possible moment of any case of his which calls for the coroner's intervention. If he disregards this courteous procedure, he not only ruffles the coroner, who is a very autocratic individual and capable of being extremely unpleasant on the telephone, but what is of more immediate concern to the doctor, he runs the risk of alienating the regard and possibly the future patronage of the family of the deceased. If the doctor contents himself with posting his certificate to the registrar, who, upon receipt of it, posts the appropriate form to the coroner, it is three days after the death before the coroner knows anything at all about it. It is very inconvenient and unpleasant for the relatives to be informed, perhaps on the eve of the funeral, that an inquest must be held.

The majority of doctors in this city fully realise the position, and are anxious to work in harmony with the coroner, but difficulties do arise through a doubt as to the circumstances under which a doctor should communicate with the coroner. This question is answered by reference to Section 3 (1) of the Coroners' Act, 1887, which enacts: "Where . . . . . there is reasonable cause to suspect that such person has died either a violent or unnatural death, or has died a sudden death of which the cause is unknown, or that such person has died in prison . . . . . the coroner shall . . . . ." in effect hold an inquest.

Violent or unnatural deaths include all cases where death is due to an accident of any kind—however trivial the original accident may have been. They also include deaths from all forms of poisoning, including not only acids and alkalis, but alcoholic or food poisoning, or death from industrial disease, or deaths from suicide.

Deaths under Anæsthetics.

To this cause of death I should like to call your special attention, because I believe that the practice which I adopt is not universal. For my part, I cannot see how such deaths under anæsthetics can come under the category of deaths from natural causes, and I therefore always hold inquests in such cases. In most cases it is true that the inquest is a pure formality, and I sympathise very sincerely with doctors who have to attend an inquest in cases where they have been called upon to give an anæsthetic to a patient where the chances of his surviving the operation were very remote, but I can assure them that in such cases not the slightest reflection is cast upon their skill.

I am convinced that the holding of an inquest is a great public safeguard, and that it is a good thing to satisfy people that everything has been properly carried out, and that all proper precautions have been taken, and that all known means of resuscitation were at hand and employed. In some cases—fortunately very few—I have found that my Inquiry has been fully justified, and it is only on such occasions that I have any adverse comment to make.

With regard to cases of accidents, I find that sometimes a doctor fails to report a death from a simple accident, and the excuse given for his omission is that he did not report it as no question of compensation was involved. Of course, that is an entirely erroneous impression. The coroner has to hold an inquest in every case where death has been caused or accelerated by an accident, quite apart from any question of compensation. Another mistaken impression is that it is not necessary to inform the coroner where death has occurred more than a year and a day after the accident. This impression springs from the fact that no person who has inflicted the injury can be convicted of murder or manslaughter if death ensues after the lapse of a year and a day from the injury, but the coroner is solely concerned with the question as to whether the injury has or has not caused or accelerated death.

Compensation Cases.

Cases where compensation may be involved demand especial care. I very frequently get cases where the doctor gives a certificate of death from some natural cause, but where the relatives mention to the registrar or to me that the deceased had an accident at his work some months ago, or has been working amongst lead or chemical fumes, and the question is raised whether the accident or the work upon which the deceased has been engaged has attributed to his death. In such cases I always hold an inquest if desired to do so by the relatives and order a post-mortem examination. This does not mean that I distrust the diagnosis of the doctor, but the matter has to be fully investigated. If I were to refuse to hold an inquest and the case went for compensation, the county court judge might want to know why no inquest had been held. Very often the doctor has never been informed of the accident or condition of work, and he should always make careful inquiries on these points, and where he has reason to believe that the relatives consider that the accident has contributed to the death, he should always report it to the coroner.

Cases of sudden death do not necessarily demand an inquest. Where the doctor has attended a patient for heart disease, for example, and death occurs suddenly, a doctor is quite in order in giving a certificate if he is satisfied that no other cause, such as accident or poison, has contributed to the death, but under the regulations contained in the last Registration Act, 1927, the registrar has to refer to the coroner all cases where the deceased has not been seen by the doctor after death, or within 14 days of death, and in such cases it is a great convenience to all concerned if the doctor notifies the coroner at once. But informing the coroner does not relieve the doctor from his duty of issuing a certificate where the cause of death is diagnosed.

The Question of Fees.

The only payment authorised by statute is a fee for giving evidence at an inquest, or for making a post-

mortem examination. No payment is made by me for any letter written to me by a doctor or any other communications. I want to emphasise the fact that I do not order a doctor to make a written report. The letters to which I allude are purely voluntary communications. In cases where I have to ask for information on the telephone, I am invariably assisted with the very greatest courtesy by the doctors in this city. If a doctor is in any doubt whatever about a case he should consult the coroner, for I am only too ready to assist them as they assist me. Content yourselves with stating the facts, and leave the responsibility to the coroner. Never try to evade an inquest. I have two golden rules. In all cases where the relatives desire an inquest I always hold one, and whenever any undue pressure is brought to bear upon me not to hold an inquest I always hold one. This practice I have found to be fully justified on many occasions.

It has never been my practice to call doctors unnecessarily—e.g., in simple cases of fall down stairs or burns, where I get evidence of the injuries from other sources, but in cases where compensation is involved I generally call the doctor, as the employers or insurance companies may desire to cross-examine the doctor through their counsel.

Evidence in Court.

On the question of giving evidence in court, perhaps I may be permitted to give you some hints.

(1) Always speak up, so that everyone may hear you. Do not act as if you were carrying on a private conversation with the coroner; remember that relatives have a right to hear what you say and an interest in your evidence.

(2) Make your language as simple and as untechnical as possible.

(3) Be as concise as you can, but at the same time be luminous.

(4) Formulate your opinion and conclusions with care, and do not allow yourself to be shaken by cross-examination. I do not mean by this that you can always be exact. Medicine is not an exact science,—e.g., you may say death was undoubtedly, in my opinion, caused or accelerated by the accident, or, in my opinion, the accident had no connexion with the cause of death, or you may say I am unable to say definitely whether death was caused or accelerated by the accident or not. But once you have made up your mind, hold your ground, and do not allow yourself to be shaken by cross-examination.

(5) Do not show any resentment at being cross-examined. Remember, it may be counsel's duty to try to weaken or negative your evidence. Content yourself with reiterating your conclusions or adding reasons for those conclusions.

THE PRACTITIONER'S EMPLOYEES.

THEIR POSITION UNDER NATIONAL INSURANCE.

MEDICAL and dental practitioners are often in doubt about the position of their employees under the various Acts which regulate national health insurance, contributory pensions, and unemployment insurance. An explanatory memorandum (317/X) has therefore been issued by the Ministry of Health and other departments concerned. The main facts may be summarised as follows:—

Health and Pensions Insurance.

Under the National Health Insurance Acts and the Widows', Orphans', and Old Age Contributory Pensions Act contributions have in general to be paid for everyone over 16 who is earning not more than £250 a year for whole-time service, and also for everyone whose employment is by way of manual labour. Thus, subject to what is said below, health and pensions contributions are payable for nurses, dispensers, secretaries and reception clerks, dental mechanics and apprentices, domestic servants, hall-porters, and chauffeurs.

The contributions for such persons must be paid for each week during which they are employed; and in any week when they have been employed in an insurable capacity by more than one employer, the first employer is responsible. These requirements are explained in detail in Pamphlet A, which may be had from the Health Insurance Departments of the Ministry of Health, Whitehall, S.W. 1.

Rate of Remuneration.—In arriving at the rate of remuneration of employees (other than manual workers) account should be taken of the value *to the employee* of any emoluments in kind, such as board or lodging, provided at the employer's expense. The cost to the employer, though often a useful guide, is not necessarily to be taken as the value of remuneration in kind. "The employer and the employed person," says the memorandum, "will usually be in a position to agree as to what should be taken as a fair money equivalent of the value of such emoluments to the employed person, and it is only in cases of special difficulty that reference need be made to the Insurance Department. Ordinarily, the value of board and lodging is assessed at about 35*s.* a week. In the case of part-time employment the equivalent remuneration for normal whole-time employment should be taken."

Manual Labour.—The question whether an employment is or is not by way of manual labour is only material where the pay exceeds £250 a year, as persons who receive less are insurable in any event. The question arises principally in the case of dental mechanics and chauffeurs.

A dental mechanic is employed by way of manual labour, notwithstanding that he supervises assistants in addition to engaging in the manipulative work involved in making dentures, plates, artificial teeth, crowns, &c. A decision of the Minister of Health to this effect has been upheld by Mr. Justice Roche in the High Court. On the other hand, a dentist's assistant who is engaged in the ordinary duties of a qualified dentist and who attends to patients in that capacity is regarded as employed otherwise than by way of manual labour. But where such an assistant also takes part in mechanical work, regard must be had to the main and substantial nature of his duties. If he is substantially employed as a dental mechanic he is a manual worker. In case of doubt reference should be made to the Insurance Department for a ruling.

A chauffeur who is required to clean the car and to effect running repairs, besides driving, is normally regarded as employed by way of manual labour, and is, therefore, compulsorily insurable irrespective of his remuneration.

*Unemployment Insurance.**

From the practitioner's point of view there are three main classes in which liability to unemployment insurance does not coincide with liability to insurance under the Health Insurance and Pensions Acts—viz., employment as a female professional nurse for the sick, employment in domestic service, and employment in agriculture (including horticulture).

Female nurses have been excepted from unemployment insurance since July, 1922. The exception does not, however, extend to dispensers, secretaries, or persons employed by doctors or dentists on such duties as to receive patients, make appointments, answer telephone messages, clean and sterilise instruments, clean and dust surgery fittings, mix cement, hand instruments, &c., to the dentist, or attend on anæsthetic cases, unless the attendant is a duly qualified nurse and employed as such.

Employment in domestic service is excepted from liability to insurance only where the employed person is not employed in a trade or business carried on for the purposes of gain. It has been held by Mr. Justice Roche in the High Court that a doctor is carrying on a business for the purpose of gain within the

* The requirements of the Unemployment Insurance Acts are set out in detail in Leaflet U.I.L.4, which may be had from the Ministry of Labour or from any Employment Exchange or Branch Employment Office.

meaning of the Acts, and domestic servants employed in that business are therefore required to be insured. The judge decided that a chauffeur employed primarily to drive a doctor on his rounds, and a domestic servant employed by a doctor in a nursing home carried on by him in addition to his practice, were employed in the business of their respective employers. These decisions are held to cover in principle chauffeurs employed to drive or accompany doctors on their rounds, servants employed to attend upon the patients or staff in a nursing home, and servants employed at the surgeries of doctors or dentists to admit patients, make appointments, or otherwise in connexion with the employer's professional requirements.

Servants employed in doctors' or dentists' private residences solely in connexion with their employers' personal needs, and servants whose duties in connexion with their employers' business are confined to cleaning the surgery and admitting occasional patients, are not regarded as employed in the business and are not, therefore, required to be insured against unemployment. Servants employed by doctors or dentists in connexion partly with their employers' professional requirements and partly with the employers' personal needs should be regarded as insurable if their substantial employment is employment in the former capacity. It has been held by Mr. Justice Roche in the High Court that one-third is a substantial part of an employee's working hours.

Employment in agriculture—e.g., as a gardener, whether regular or jobbing—is totally excepted from unemployment insurance.

The Services.

ROYAL NAVAL MEDICAL SERVICES.

THE following appointments have been made: Surg. Lt.-comdr. G. S. Rutherford to *Calypso* and Surg. Lt. A. M. Lawrence-Smith to *Hermes*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. St. G. B. D. Gray to be Surg. Lt.-Comdr.
Proby. Surg. Lt. R. H. Enoch to be Surg. Lt.
Proby. Surg. Sub-Lt. K. E. L. Yuill to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. D. S. Buist, half-pay list, late R.A.M.C., retires on retd. pay on account of ill-health.
Capt. R. R. Evans to be Maj. (prov.).

TERRITORIAL ARMY.

W. G. Platt to be Lt.

RESERVE OF AIR FORCE OFFICERS.

Flight Lt. W. Parsons resigns his commission on appointment to a commission in the Royal Army Medical Corps.

INDIAN MEDICAL SERVICE.

Capt. (prov.) F. W. H. Caughey relinquishes his proby. appointment.

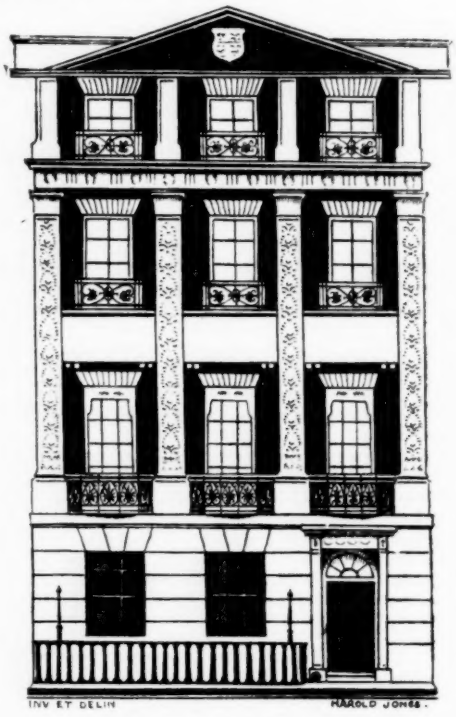
The undermentioned have vacated their appointments in India:—A.D.M.S.: Col. W. O'S. Murphy, I.M.S., A.D.M.S. (temp.): Maj. (Bt. Lt.-Col.) R. A. Bryden, R.A.M.C.

ELSIE INGLIS HOSPITAL, BELGRADE.—On Thursday last week Anne, Viscountess Cowdray, opened the hospital which has been erected in Belgrade in memory of Dr. Elsie Inglis, who went to Serbia during the war as Commissioner for the Scottish Women's Hospitals.

A CENTRAL ANÆSTHETISING PLANT AT ST. BARTHOLOMEW'S.—The basement of the new surgical block now being erected at St. Bartholomew's Hospital will be fitted with a central anæsthetising plant. Pipes from cylinders of hardened steel will carry oxygen and nitrous oxide to the various theatres where taps and a mixing chamber will facilitate the adjustment of the components. More than 20,000 gallons of gas are used in the hospital every week.

THE NEW HOME OF The Lancet.

IN the course of the next few days THE LANCET Offices will be transferred from 1, Bedford-street, and the adjoining house in the Strand, where our home has been for the past 80 years, and more, to 7, Adam-street, Adelphi, London, W.C., premises only 100 yards from the old address.

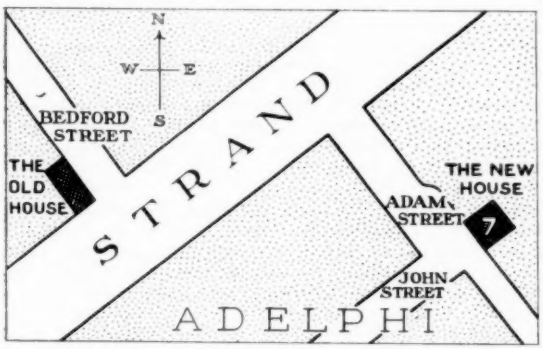


NO. 7, ADAM-STREET, ADELPHI.

During the past 105 years the editorial office of THE LANCET has been in, or within a few yards of, the Strand, and in the immediate vicinity of the new address. Originally the paper was edited from a house in Norfolk-street, Strand—a very different street in appearance from the present Norfolk-street. Here Thomas Wakley, the Founder of the paper, was engaged in private practice; here he was discovered by Sir Astley Cooper abstracting (Cooper called it "pirating") the great man's lectures, which were in course of delivery before the United Medical Schools of Guy's Hospital and the then adjacent St. Thomas's Hospital. The business of the first printer of the paper, G. L. Hutchinson, was carried on within a few paces, in the Strand. During the first 25 years of our existence the editorial work was done largely in Wakley's private house, but the printing office was changed several times, there being, as a matter of fact, no particular anxiety on the part of any firm to be even partly responsible for the issue of a newspaper whose activities were being so often, and so expensively, discussed in the law courts. But in Bolt-court, Fleet-street, Wakley at last found printers who for ten years acted as publishers, the firm being that of Mills, Jowett and Mills, of whom Jowett was the father of the famous Master of Balliol. In 1836 Wakley decided to become—probably was forced to become—personally responsible for publishing, as well as editing, his paper, and this he did

from an address in Essex-street, Strand. But six years later the firm of Churchill came upon the scene, providentially it appears, for Wakley was a reckless man of business, as well as much absorbed in Parliamentary affairs. A situation of pecuniary uneasiness was thus relieved, and five years later Wakley resolved to be again his own publisher. In 1847 the lease of the building at the corner of Bedford-street and the Strand, now being evacuated, was acquired, and in this building during the 82 years of tenure THE LANCET has been published. Until early in 1921 the paper was printed at these offices, as well as edited and published, and during that period considerable additions to the house were made, as well as many internal transformations carried out. But in 1920 the interests of Wakley and Son, Ltd., having passed into the hands of Messrs. Hodder and Stoughton, the composing rooms were done away with, and since 1921 Messrs. Hazell, Watson and Viney, Ltd., have been responsible for the printing.

The proprietors of THE LANCET have now purchased as a freehold 7, Adam-street, Adelphi, and the work of editing and publishing will be transferred there in the course of the next fortnight. The accompanying illustrations show the façade of our new home, and its situation in the famous quadrangle of symmetrical streets, erected on arches. This beautiful piece of building was designed and executed by John, Robert, James, and William Adam, on the site mainly of old Durham House, which had become a more or less derelict district of mud and slime, used only for the mooring of coal barges for the supply of a London and a Westminster which had then no existence beyond Hyde Park Corner. The streets in the Adelphi were named after the Christian names of the four brothers, though William-street has since been changed to Durham House-street. But to the bounding street on the east was given the name of Adam-street, while the beautiful pile facing the Thames received the name of Adelphi-terrace. It may require imagination to see the influence of Diocletian's famous palace at Spalato upon the architecture of the Adelphi, but Robert Adam, the most celebrated of the four brothers, made a careful study of that magnificent



ruin, and has himself recorded that he did this designedly, when determining to apply classical models to modern dwellings; because the Emperor's huge villa—it now constitutes the skeleton of nearly all the town of Split—was built as a residence, and was not a public institution such as usually formed a model for imitation or a source of suggestion. The whole enterprise of constructing the Adelphi was attended with difficulty. The elegant streets had to be constructed on arches for the securing of a foundation and of provision for wharfage on the Thames below, while obtaining a level access from the Strand. The expense incurred was huge, and was swollen by the legal opposition to the scheme from the Corporation of London, which body put forward proprietary claims to the foreshore. However, one private Bill in Parliament disposed of this matter, while another private Bill sanctioned the institution of a lottery for raising further funds, and finally the work was completed.

No. 7 Adam-street is the central feature of a line of houses in the eastern street, and faces down John-street. It was, 100 years ago, the town house of Mr. Christopher Smith, then Member of Parliament for St. Albans. It became, 20 years later, the home of the Evangelical Alliance, which was inaugurated in Liverpool in 1845. Sir Culling Eardley, one-time Member of Parliament for Pontefract, and the founder of the Evangelical Alliance, resided at 7, Adam-street in 1858. Under his direction the early activities of this body, designed to constitute a working union between Protestant peoples, while forwarding the cause of religious liberty, were fruitful. For the Alliance secured recognition of the Christian faith from the Sultan of Turkey and the Khedive of Egypt, the repeal of penal laws in Sweden against Roman Catholicism, and elsewhere liberal reforms in favour of Jews. Later the religious atmosphere of the house became very pronounced, for its walls sheltered, in addition to the Evangelical Alliance, missionary, educational, and charitable associations. For the next 25 years this character was retained, but our immediate predecessors in the house were, appropriately enough, considering the character of the structure, a firm of architects. The reconstruction was carried out under the direction of Mr. Graham R. Dawbarn, A.R.I.B.A.

An informal At Home was held on Wednesday evening, Oct. 16th, on the new premises.

MEDICINE AND THE LAW.

Doctors Fined under the Dangerous Drugs Acts.

THE maximum penalty for failing to comply with Regulation 2 of the Dangerous Drugs Consolidated Regulations in the matter of keeping a register and making the prescribed entries therein is 12 months' imprisonment, or a fine of £250, or both. Fines considerably smaller than the maximum have hitherto been inflicted, but magistrates are disposed to warn defendants that the offence will be seriously regarded in future. Earlier in the month two London doctors were ordered to pay fines of £20 and £10 respectively at Marlborough-street police-court, with 10 guineas costs in each case. It appeared that the police had been pursuing inquiries into a case where it was suspected that a man and woman were obtaining drugs otherwise than for their personal use, and were trafficking in them in an improper manner. A detective-inspector visited a number of chemists, and found prescriptions signed by the two doctors, against whom proceedings were taken. One of the two doctors, who had omitted to enter a certain quantity of heroin, attended at Scotland Yard and was shown certain prescriptions. He admitted that these were signed by himself, and that the contents of four of them were in the handwriting of the patients. He also admitted that ten orders for drugs obtained for professional use, though signed by himself, were in the handwriting of the man whose dealings the police were investigating as already stated, and that although the orders were marked "for professional purposes," the drugs were obtained for, and were sent direct to, this man. He further admitted that he had kept no official register; he produced a list of drugs given to the man and woman, but it was stated on behalf of the Director of Public Prosecutions that the list in no way complied with the Regulations. In this case the doctor, who pleaded that he was an anæsthetist, not in the habit of prescribing dangerous drugs and entirely ignorant of the Regulations, was fined £10. In the other case there were similar features, prescriptions having been signed by the medical practitioner and filled in by the patient, and no proper register having been kept. The doctor produced a memorandum pad containing entries in

pencil, but in this case, again, the prosecution contended that the document failed to comply with the Regulations, there being in particular no record of purchases. The defendant pleaded forgetfulness, due to overwork and ill-health, and added that the Act was difficult to interpret. The magistrate imposed a heavier fine in this case, on the ground that this defendant was aware of the need of keeping a register.

Members of the medical profession naturally find the meticulous compliance with the Dangerous Drugs Regulations a troublesome duty which, in moments of pressure, they may be inclined to postpone. The increased vigilance of the police in these matters brings irregularities to light sooner or later. It is not that the police invade the consulting-room at random in order to see if the Regulations are obeyed; it is rather that the police, in following up some allegation of improper traffic in drugs on the part of laymen, are obliged to trace the documents back to the source.

THE NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

ANNUAL CONFERENCE IN NEWCASTLE-UPON-TYNE, OCT. 10TH–12TH, 1929.

THE fifteenth annual conference of this Association was opened on Oct. 10th by the Lord Mayor (Councillor A. W. LAMBERT, M.C.), who welcomed the delegates on behalf of the city of Newcastle. Over 350 delegates attended including more than 200 members of the medical profession. We report the four chief sessions.

A Sociological Survey.

Under the chairmanship of Sir ROBERT PHILIP (Vice-Chairman of the Council) the first paper was read by Mr. HENRY A. MESS, Ph.D. (Director of the Tyneside Council of Social Research), entitled Tuberculosis on Tyneside. Dr. Mess said that a survey of social conditions in 13 industrial towns on Tyneside had been undertaken during the years 1925–28, and it had been found that with the exception of two middle-class "dormitories," all the towns had death-rates from pulmonary tuberculosis for the quinquennium 1921–25 considerably in excess of the national death-rate; in respect of non-pulmonary tuberculosis the figures were even worse. Overcrowding existed in the houses of Northumberland and Durham to an extent unparalleled in England and Wales, and this coincided, except in the mining districts, with the excessive death-rate from tuberculosis. The overcrowding was not only within the homes; in addition there was overcrowding of houses on the land resulting in an unusually large outpouring of domestic smoke, with depletion of sunlight together with the impossibility of effective isolation of diseased individuals. The local industries, shipbuilding and ship repairing, were very subject to violent fluctuations—livelihood was therefore uncertain and often scanty, leading to worry and malnutrition, which predispose to the disease.

Discussion was opened by Councillor JOHN BARKER (Chairman of the Tuberculosis Committee, Newcastle-upon-Tyne) who dealt with the local situation and the facilities provided for handling the problem, and made special reference to Newcastle's position. He warned local authorities against building types of low-rented houses which would in 20 years' time present another slum problem, suggested that the National Association should press the Ministry of Health for stricter obligation on local authorities to provide adequate tuberculosis dispensaries, educational agencies, and institutional segregation, and recommended the setting up of regional advisory councils.—Dr. H. KERR (M.O.H., Newcastle) paid a tribute to Dr. Mess's work locally, and said that it had aroused the tuberculosis conscience of Tyneside.—Dr. R. VEITCH CLARK (M.O.H., Manchester) stated that while there must be earlier and more complete notification of all cases occurring, there should be assurance that something would be done for the persons notified.—Councillor GRIFFITHS (West Riding of Yorkshire) said that Dr. Mess's figures only applied to the years 1921–25, and that since 1926 the mining population were suffering from tuberculosis more than ever owing to malnutrition, unemployment, and low wages.—In reply to the last speaker, Dr. S. G. MOORE (M.O.H., Huddersfield) pointed out that while privation and poverty play an essential part in tuberculosis as well as other diseases, the children of the rich also suffer and die from the fell disease.

The Factors that Produce Adult Pulmonary Tuberculosis.

Dr. EDOUARD RIST (Paris), in introducing the subject, said that the old traditional idea that consumption was due to some mysterious constitutional or hereditary predisposition must be abandoned. In civilised communities the adult was not, like the infant, virgin soil for the tubercle bacillus—disease in the adult was not the result of a first infection. Infection occurred in childhood, leaving the subject healthy and immune for years until, under the stress of adverse conditions, he more or less suddenly fell a victim to the disease. Physical vigour in itself did not protect against tuberculosis: the intensive training of the pugilist offered no guarantee against the disease. While a rational and well-ordered, well-regulated mode of living would undoubtedly reduce the liability to infection, it must be admitted that the actual causes of a breakdown were largely obscure; only a few factors were more or less definitely known or suspected, and it was left to the coming generation to discover those of which we were to-day utterly ignorant.

Dr. A. F. BERNARD SHAW (College of Medicine, Newcastle-upon-Tyne) followed with a contribution from the pathological side. His paper dealt with the value of the experimental method and the phenomena of virulence, resistance, and allergy in the study of tuberculosis. Mentioning that it was extremely rare in civilised communities to find in adults progressive pulmonary lesions resembling those found in the primary infection of childhood, he maintained that the rarity of such cases was in strong support of the idea that the bacilli of childhood infection do not commonly survive to adult life in numbers sufficient to serve as the origin of adult phthisis, and was of opinion that pulmonary tuberculosis occurring in adolescence or later was due to reinfection from without.

Dr. C. G. R. GOODWIN (Medical Superintendent, Barrasford Sanatorium), dealing with the subject from the medical standpoint, said that infection with the tubercle bacillus, though an essential factor, was not the sole cause of manifest pulmonary tuberculosis, and was of opinion that active lung tubercle in adult life was not due to a new or recent infection, but was an extension from a pre-existing focus, laid down in childhood, and that this extension and spread were due to adverse environmental conditions in the home and/or prolonged chronic fatigue. To reduce the incidence of the disease, he advocated adequate separation of advanced cases from children, and improvement of the housing and social conditions of the poor. Further, he advised that the public should be clearly taught, first, that those who gave themselves no leisure were prone to develop a state of chronic fatigue with loss of weight and increased liability to tuberculosis; and, secondly, that when maintained loss of weight occurred medical advice should be sought.

Sir THOMAS OLIVER (Vice-Chancellor, Durham University) dealt with the industrial aspect of the disease and said that occupation might favour its development by locally predisposing the pulmonary soil for the reception of the bacillus and by reducing

the general resistance of the worker. Speaking of the relationship of pulmonary disease to dust inhaled at work, he instanced the decreased incidence of phthisis among steel-grinders as a result of improved methods of ventilation and changed methods of operating. He considered the granite industry at home and abroad, and directed special attention to the work of the South African Miners' Phthisis Medical Bureau. He also detailed some experiments conducted by himself which showed that the finest particles of dust did not absorb water, and expressed the opinion that those particles were the cause of silicosis where rock-drilling was accompanied by water sprinkling.

Instruction of the Public, the Tuberculous, and the Medical Student.

Dr. WILLIAM BRAND (Medical Commissioner to the Association) gave an address on a Scheme of National Propaganda Regarding Tuberculosis. Quoting the aphorism of the late Dr. Herman Biggs that "health is purchasable," Dr. Brand said that this was the case for propaganda in a nutshell provided we knew what to buy. It was incumbent upon those with specialised knowledge to share it with the public and instruct the masses in tuberculosis, its causes, prevention, and the general principles of treatment. Antituberculosis propaganda must not be intermittent, but should be constant and insistent. The subject should be approached through every possible channel—e.g., the schools, the Boy Scout movement, the press, and the medical and nursing professions—besides the official public health services.

Dr. A. H. MACPHERSON (Medical Superintendent, Burrow Hill Sanatorium Colony) read a paper on the Combined Treatment and Technical Education of Tuberculous Youths. The Burrow Hill Sanatorium Colony had been reorganised, he said, to provide combined treatment and technical training for youths between the ages of 14 and 19 years. Courses of training were given in gardening and clerical work. The cost, £2 10*s.* per week, was defrayed by the authority responsible for the patient's admission. Forty-six youths from various parts of the country were in residence and the results were very hopeful, but the success of the scheme depended largely upon the coöperation of the local care committees and their ability to find permanent employment for the trainees. —Dr. NOEL BARDSWELL (Medical Adviser to the London County Council) followed with a glowing account of the colony, its situation, surroundings and its work, and expressed the opinion that the patients should derive great and lasting benefit from residence in the institution.

Prof. THOMAS BEATTIE (Durham University), speaking of the Teaching of Tuberculosis to Undergraduates, deprecated the institution of special courses in tuberculosis, and expressed the fear that the general standard of medical education would suffer if more special subjects were included in the curriculum. He held that tuberculosis was so intimately connected with general medicine and surgery that teaching in it could be best imparted by the professors of these subjects supplemented by instruction gained in the bacteriological and pathological departments. He hoped that the present inadequate supply of clinical material would be increased when the poor-law hospitals were taken over by the local authorities.—Dr. FERGUS HEWAT (Edinburgh University) said that the teaching of tuberculosis to undergraduates was regarded as an essential part of the medical curriculum in all Scottish universities. Such teaching should be given in the final year of study.—Dr. JAMES CROCKET (Glasgow University) said that only two things had to be considered: (1) Was there the need? and (2) Was there the time? He maintained that the need and the time for special study of tuberculosis both existed, and outlined the course at Glasgow.—Dr. A. TRIMBLE (Belfast) thought that the teaching of tuberculosis was so necessary that it would pay the municipalities to subsidise a lectureship in every medical school.—Dr. M. DAVIDSON (Brompton Hospital) remarked upon the lack of clinical material for the teaching of pulmonary tuberculosis in the general hospitals and advocated closer coöperation between these and the poor-law hospitals.

Dr. W. H. DICKINSON (Newcastle-upon-Tyne) read a paper on the

Training of Tuberculosis Medical Officers.

After the usual house appointments, he advised a period of general practice, followed by a post in some department of the public health service other than tuberculosis, so that the prospective tuberculosis officer might be imbued with spirit and ideals of prevention. A junior appointment in a large sanatorium or special "chest" hospital should precede application for a post as assistant tuberculosis officer. Dr. Dickinson laid special stress upon the importance of post-graduate study in general medicine as well as tuberculosis and the recommendations of the Astor Committee regarding study leave were quoted.—Dr. J. D. LEIGH (Sunderland) said that special training in surgical tuberculosis was necessary, and pointed out that some hospitals contended that non-pulmonary tuberculosis should be prevented and treatment ought to be a direct charge on the municipalities.—Dr. F. J. H. COUTTS (Ministry of Health) emphasised the importance of the subject and paid a handsome tribute to the zeal and enthusiasm of the members of the tuberculosis service under difficult conditions.—Dr. J. CROCKET (Glasgow) said that the course of study for the D.P.H., as at present constituted, was not of much value to the tuberculosis officer. He suggested that the value would be enhanced if the examination could be modified to allow candidates to pass in special subjects—e.g., tuberculosis.—Dr. J. C. GILCHRIST (Welsh National Memorial, Cardiff) pointed out the value of contact with students to tuberculosis workers, and mentioned that the tuberculosis officers and sanatorium superintendents were recognised teachers in the University of Wales. He also alluded to the value of the quarterly meetings of the staff of the Welsh National Memorial Association, with clinical discussions and pathological demonstrations.

Dr. HARLEY WILLIAMS (Assistant Medical Commissioner, N.A.P.T.), in the course of an address on Methods of Local Propaganda Regarding Tuberculosis, said that it was only in recent years that propaganda had come to be regarded as a legitimate part of the campaign against disease. The greatest difficulty was the ignorance surrounding the question of tuberculosis, and he urged a great extension of the teaching of the subject to the lay public, especially through the medium of the schools.

The session concluded with an address on Dentistry in Relation to Tuberculosis by Dr. WILLIAM GUY (Edinburgh), in which he laid emphasis upon the importance of preventive measures before infection occurred, and upon the necessity of an efficient dental service at all sanatoriums, clinics, and dispensaries.

A HOSPITAL BANNER.—A banner made by the patients of Grangethorpe Ministry of Pensions Hospital in 1927, in memory of the 330 patients who have died within its walls, has been placed in St. James's Church, Birch-in-Rusholme, Lancashire, and dedicated by the Bishop of Middlesex. Grangethorpe, which was originally a military hospital, ceases to be a Ministry of Pensions institution at the end of the present month.

WEST BROMWICH GENERAL HOSPITAL.—The report of the medical committee for the year ended on June 30th last, signed by Dr. L. A. Dingley, the chairman, states that the 1533 in-patients formed a "record." The general death-rate was 4·3 per cent.; 2·3 per cent. died within 48 hours of admission. In the casualty department 10,171 cases were treated, and the medical staff urge the importance of replacing this building, which is out of date and unsuitable to the heavy demands upon it.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Nursing and Midwifery.

ADDRESSING the annual meeting of the Midlothian County Nursing Association, Dr. Parlane Kinloch, Chief Medical Officer of the Department of Health for Scotland, spoke of the need for a radical reorganisation of the training of nurses. At present any girl looking forward to making a comprehensive profession of nursing would be in a position of tutelage for ten years, including three or four years of general training, three years' experience of fevers, one year of maternity work, a year at mental diseases, and so on. The thing was ridiculous. He looked forward to the time when a woman going in for nursing would get a comprehensive training within four to five years. He aimed at the orientation of the county service of Scotland round the medical schools of Edinburgh, Glasgow, St. Andrews, and Dundee and Aberdeen. This would provide the utmost efficiency, with reasonable economy. A million and a half pounds a year were being spent on a national health insurance system that was breaking down at the vital point—where the person needed nursing and hospital treatment. In the women's wards of the general hospitals 75 per cent. were there to seek remedy from the results of the present state of midwifery practice in Scotland. These things could be put right by a proper system of prenatal service, which the local authorities were called upon to provide, and by a proper midwifery service; but it could only be done by a combination of the voluntary and official organisations. They had met the voluntary hospitals, and got them organised into regions. When they knew what the voluntary systems could do, they would say to the local authorities: "You fill up the gap." The same thing held as regards this great nursing service.

Highlands and Islands Medical Service.

The Secretary of State for Scotland has received Cabinet sanction to introduce a Bill to amend the Highlands and Islands Medical Service Act. Under this Act an annual expenditure of £42,000 was authorised, but after 15 years' experience it has been found that the sum is too small for the schemes already developed, and the annual total expended for the last few years has been over £60,000. The new Act will probably provide for a larger annual sum, and may contain some amendments indicated by experience. The medical service (including nursing) arranged under the Act is, at least in Great Britain, a unique experiment in so-called "State medical service." Its success is now recognised.

The Glasgow Mental Colony.

A considerable time ago the Glasgow District Board of Control decided to convert the house and grounds of Lennox Castle, Stirlingshire, into a colony for the care and treatment of mental defectives. The scheme is one of the largest ever undertaken by the Glasgow Board, which will now be able to classify their mental defectives in a much more satisfactory way. Lennox Castle will accommodate 1000 patients, and this will probably meet the needs of Glasgow and the west of Scotland for some years. Stone-Yetts, another large colony both for epileptics and mental defectives, which has been worked on modern lines under Dr. Chislett for many years, will now be available for other poor-law purposes. With the Gogar-Burn Institutions for Edinburgh and the east, Lennox Castle and Stone-Yetts in the west, and the Royal Institution at Larbert in the centre, Scotland is rapidly making up leeway in her provision for the selected feeble-minded and their permanent care.

The Young Offender.

Mr. Tom Johnston, Under Secretary of State for Scotland, at the annual meeting of the Glasgow Council of Juvenile Organisations, said that he thought there was great need for more careful examination into the causes and prevention of crime. The theory of public and legal vengeance was archaic. It got nowhere at all, and a deterrent theory was getting but a very short distance. It had been stated in America that nine-tenths of the criminals in prisons ought never to have been there. He had heard the chairman of the Glasgow Parish Council say that three-quarters of the unfortunates who reached the Council under the label of "mentally deficient" ought never to be there either. In view of such statements he thought it was time that they bestirred themselves municipally in an endeavour to prevent these institutions from being choked with boys and girls, young men and women, and also old men and old women, who ought never to have been allowed to drift that length.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Stresemann's Illness.

THE late Mr. Stresemann suffered from nephritis, which was discovered about six years ago. Notwithstanding the great strain of his political work, he felt comparatively well until he contracted pneumonia in 1926. After that his general health deteriorated and he nearly died of renal insufficiency in 1928. He recovered sufficiently to take up again the burden of his office as Foreign Minister, but attacks of cardiac weakness gradually developed and on his journeys to conferences abroad he had to be accompanied by his medical attendant. At the Hague Conference this summer, which was associated with an enormous amount of work and much excitement, his illness grew worse, and his foreign colleagues noticed a great change in his condition. After the Hague and Geneva Conferences he took a short holiday at Vitznau on the Lake of Lucerne. A few days before his death he returned to Berlin, where party troubles induced him to leave his bed against medical advice. He was not a very obedient patient and it was very difficult for his medical advisers to make him follow their prescriptions. He indulged in smoking and was not a total abstainer, contrary to dietetic rules. On the evening of Oct. 2nd he had a cerebral hæmorrhage with paralysis of the left side. His medical attendant, Prof. Zondek, and Prof. Kraus were called in, but he died six hours later without regaining consciousness.

Lead Poisoning as a Legacy of Gunshot Wounds.

Notwithstanding the enormous number of gunshot wounds received in the late war in which bullets or fragments of metal remained in the body, the number of cases of lead poisoning from this cause has been very small; in fact no more than eight seem to have been recorded. In the *Deutsche Zeitschrift für Chirurgie* Dr. Hage has lately described a new case, in which the patient was a meat inspector who had been wounded in the war in German South-West Africa 22 years ago. In 1926 he complained of tremor of the fingers, headache, and colics, and gradually his complexion got the characteristic lead pallor, whilst a blue line developed on the gums and there was weakness of the extensor muscles. The presence of basophile erythrocytes and an increase of hæmatoporphyrin in the urine left no doubt of the diagnosis of lead poisoning, and by radiography it was ascertained that there were some splinters of metal in the femur. As the man had nothing to do with lead, the poisoning was evidently due to those splinters. Hage draws attention to the lapse of 20 years since the injury, and suggests that this time interval may explain why but few cases of lead poisoning have so far been noticed among men wounded in the late war.

Boycott of a Medical Man.

A medical man whose motor-car was damaged by a railway car claimed damages which according to the railway company were excessive. The company thereupon told its employees not to consult this doctor, and the works committee, under pressure from the company, also recommended workmen to go to other practitioners. The doctor accordingly brought an action for damages against the company and won the case. By an injunction the company was first restrained from boycotting the plaintiff and was then ordered to pay him damages for the loss of a part of his practice. In judgment the court described the behaviour of the company as highly immoral and a kind of revenge. If they regarded the doctor's claim as too high their remedy was to apply to the courts or settle the matter extra-judicially. The claim of the medical man having nothing to do with his professional skill, they were obliged to recover the damages done to him. This judgment will certainly meet with the approval of the profession in general, since boycott of medical men for reasons not connected with their profession has also been tried on other occasions, though not in such an open and silly way.

Occupational Diseases of Dentists.

Dr. Mosenthal, a Berlin orthopædist, recently read a paper on the occupational diseases of the dental profession. Among these may be mentioned wounds of the fingers by bites, with or without infection, and dermatoses caused by frequent washing of the hands with sublimate of mercury. By over-exertion of certain muscles used in dental work neuroses may be caused, whilst conditions such as genu valgum and genu varum may be produced by long hours of standing. The position of the dentist at the operation chair sometimes leads to scoliosis, and flat-foot may develop as a sequel to relaxation of the muscles and ligaments. Varicose veins are also very common. Mosenthal advises dentists to remain seated at their work, as many surgeons already do in performing operations, and he recommends for that purpose a rotary chair. Certain pauses in the work when the dentist should rest in a sitting position are necessary, and he must also see that he has adequate shoes.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Post-vaccinal Encephalitis.

THE European experience with post-vaccinal encephalitis is the subject of extended comment in the current *Annals of Internal Medicine*, which reflects the very general reluctance of American pathologists to believe that a pure vaccine virus can produce encephalitis. It is not long since Dr. Richard Thompson, of Columbia University (a Fellow in Medicine of the National Research Council), reported his failure to produce vaccinal encephalitis in rabbits with a testicular virus. With direct intracerebral injection attempts to adapt the virus by brain and brain passage, at seven day intervals, gave negative results. Alternating brain and testicular passage, as used originally by Levaditi, was no more successful. Thompson considered that a possible explanation of the discrepancy between his results and those of so many European workers might be in variations in the strain of virus employed; that some would produce encephalitis without difficulty, others only after adaptation, and still others not at all. He mentions also the theory of Camus that the vaccine virus may be contaminated by some unknown neurotropic virus. It is to this latter theory that the editorial above mentioned very definitely leans. May not the unknown virus be simply the normal virus of rabbit encephalitis carried over with rabbit lymph, and may it not produce encephalitis in susceptible human beings? Up to the present four cases of post-vaccinal encephalitis have been reported in the United States. It is urged that, until the question of the ætiology of this disease is settled, the use of rabbit lymph in vaccination should be stopped.

A Healthy Summer in New York.

This summer has seen unusually healthy conditions in New York State. July saw two records broken: the infant mortality-rate of 43 per 1000 live births is the lowest July rate yet achieved, and represents a ratio of only 7·8 per cent. of all deaths; tuberculosis mortality (73·9) is also the lowest ever recorded in this month. The reported cases of tuberculosis show an increase of more than 400 over the corresponding month of last year, a striking example of improved diagnosis going hand in hand with falling mortality. The increase of 700 in the reports of syphilis is no doubt partly due to improved reporting, as well as to the fact that the venereal diseases, formerly reportable only by laboratories, have now been made reportable by physicians. Other changes made in the sanitary code relating to the reporting of disease are the dropping of erysipelas from the list of notifiable diseases and the addition of tularæmia and undulant fever. Five cases of undulant fever were reported during the month.

The Study of Morbidity.

Vital statisticians have for some years been pointing out that mortality statistics are a very poor index of the amount of sickness in a community. New York State has introduced a system of reporting sickness which already enables it to publish at regular intervals some very informing statistics. The U.S. Public Health Service is now projecting the establishment of a morbidity registration area, not only with the object of collecting important data for statistical manipulation, but also with the more immediate object of raising the standard of the reporting of notifiable diseases. As a basis for discussion it is suggested that the reporting of the following six diseases should be considered a basis for admission into the new registration area—viz., diphtheria, infantile paralysis, scarlet fever, small-pox, typhoid, and tuberculosis. The suggested minimum of efficiency which each State would have to reach before admission is 75 per cent. of all clinically recognised cases. The funds available to the public health service for this work at the present time are not large, and the success of the project will depend largely upon the coöperation accorded by the local units. If that is generously accorded it is hoped that the proposed registration area may be established by July of next year. In the meantime some valuable data are being correlated in the statistical division of the public health service from reports received from 35 different industrial sick benefit associations. One limitation of these industrial statistics is the absence from them of diseases for which benefits are commonly refused, including the venereal diseases and those which result from infractions of the law.

Phenol Wastes and the Water-supply.

The common practice in this country of adding chlorine to municipal water-supplies has given great importance to the elimination of phenol wastes on account of the fact that even small traces of phenol, when combined with a minimal quantity of free chlorine, will give to the water a most unpleasant taste. During the past five years a campaign has been conducted to exclude phenol wastes from the Ohio river. Although reliance has been placed upon education and persuasion unarmed by any legislative powers, the campaign has met with such success that to-day only four coke plants are discharging phenol wastes into the river in place of 17 such offenders in 1924. A careful record has been kept of the appearance of chloro-phenol tastes in the meantime, as well as of the flow of the river. There is a greater loss of concentration in the phenols as they pass down stream than can be accounted for by increasing dilution—the result, it may be, of biochemical oxidation.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some 1928 statistics of six towns :—

Name of town and estimated (R.-G.) population.	Birth rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Croydon C.B. (214,800)	15·7	11·0	0·96	1·52	1·5	1·9	53/20	28	3·9
Coventry C. (161,600*)	14·4	9·6	1·0	1·24	1·5	1·5	66/39	33	4·7
Derby C.B. (138,900)	19·3	10·9	0·93	1·28	1·1	1·7	60/30	26	7·5
Preston C.B. (127,100)	15·1	12·7	0·95	1·41	2·2	2·0	91/42	34	6·3
Northampton C.B. (94,070)	13·9	11·3	1·06	1·59	1·5	2·3	53/25	21	3·0
Paisley B. (88,140)	20·2	13·1	1·33	1·23	2·3	1·6	105/49	50	4·4

* The city was extended on April 1st. The above is a special estimate for statistical purposes. The mid-year estimate for the extended city was 168,134.

C. = City. C.B. = County Borough. B. = Burgh.

Croydon.

Dr. Oscar M. Holden describes Croydon as an originally residential town, which is gradually assuming an industrial character. The chief industries are iron foundries for bell-casting and engineering, and the London terminal aerodrome is within the borough. At the request of the Ministry, three members of the medical staff have performed duties at the aerodrome under the Aliens' Order, 1925. The cost of this service does not fall on the rates, and Dr. Holden points out that if the work is to be done properly a full-time medical officer will be required in the near future. Dr. Holden's experience hitherto has been in northern industrial towns, and he comments on the comparatively small figures of deaths due to respiratory diseases in towns like Croydon, but adds a word of warning that a rise in the death-rate from these diseases is likely to occur in south-eastern England owing to increasing urbanisation and industrialisation unless adequate steps are taken to prevent atmospheric pollution.

St. Mary's Hostel provided by the Croydon Mothers and Infants Welfare Association, has 17 beds for maternity cases, of which the corporation retain 15, in return for an annual grant of £1800. All cases, other than emergencies, have to pass through the municipal antenatal clinics. During 1928 the 314 admissions to the municipal beds included 11 emergencies; 193 cases had to be refused. Thanks to a legacy of £7500, aided by a municipal grant of £3000, this institution is to be extended by the erection of a modern maternity block of 32 beds, of which the corporation will rent 30. Dr. Holden mentions that the closer linking up of antenatal, natal, and postnatal activities is perhaps the most urgent matter for consideration in the maternity and child welfare scheme. One of the great lacks at present is suitable accommodation for mental deficiency cases, and the solution suggested is that Croydon should combine with other authorities to provide a large institution or colony.

From the school report we learn that ionisation and rheumatism clinics have been established. The former was opened in July under the charge of Dr. J. D. McLaggan. The cases dealt with, 48 in number, all had obstinate ear discharges. None had lasted less than six months, 1 six to twelve months, 4 one to two years, 14 two to five years, 11 over five years, and in 11 the duration was unknown. The results appear to be satisfactory so far, but no figures as to cures can be given as that implies at least six months freedom from discharge. The rheumatism clinic had a flying start on April 30th as for 18 months note had been made of suspects during routine school inspections. The full coöperation of parents and teachers has been obtained. There were 314 cases examined, of which 243 were classed as rheumatic. Interesting particulars are given of the incidence of the various rheumatic manifestations, family histories, and environmental conditions. There has been as yet no provision made for institutional treatment, but a few of the children were sent to West Wickham Heart Home.

Coventry.

Dr. E. H. Snell presents his thirty-second and farewell report, and appropriately includes in it a table giving the principal vital statistics of his first annual report for 1897 and of that for 1928. The comparison shows that the population has nearly trebled; the birth-rate has declined by 54 per cent., the death-rate by 43 per cent., infant mortality by 58 per cent., and the phthisis-rate by 23 per cent., while the mean age at death has gone up by 12·8 years. Among the advantages of Coventry, Dr. Snell enumerates a ring of commons on its borders, an almost non-existent smoke problem, a good average standard of living owing to regular employment, and the fact that two-thirds of the houses have been built in the last 30 years in accordance with modern by-laws. The insignificance of the smoke problem, he points out, is helped by the facts that practically all the works obtain their power from the electricity department, and by the large use of gas-stoves for heating and cooking. There are 40,000 gas-cookers and 14,000 gas-fires for slightly over 38,000 houses, and during the late coal stoppage there were less than 100 applications for coal permits on the ground of having no gas-cooker. Since 1916 practically nothing has been possible in the way of closing unfit houses. During the war the city was flooded with thousands of munition workers, and since the war there has been no alleviation in the great demand for houses, which is a long way from being satisfied. Some thousands of new houses could be let if they existed. Also a larger staff of sanitary inspectors is needed to deal with decay and dilapidation in the older property.

The recent extension of the city boundary raised its acreage by 4147 to 12,878 acres and the population of the added area at the middle of the year was 26,134. New problems have thereby arisen. Pig-keeping, except in such places as allotment gardens, was prohibited in the old city under a local Act of 1790, but pig-keeping in the rural added area has been an established custom from time immemorial. Other problems are polluted shallow wells and wooden shacks of all kinds used as houses. Again, there were only six cow-keepers in the old city supplying about 260 gallons per day, but the milk produced in the extended city is estimated at 1387 gallons per day. More than half the total quantity is delivered in bottles, the greater portion being pasteurised or sterilised. The question of institutional accommodation for mental defectives is a matter of growing importance. Owing to the generosity of the public to the organisations for the blind, the municipality only provides about a quarter of the amount expended in assisting unemployable blind persons. Progress has been made in the abattoir question. An ideal site has been approved close to the railway and to the cattle market, and it is proposed to erect a thoroughly up-to-date building, which will enable all the private slaughter-houses to be closed. Curiously enough the site, which is now approved, was under consideration 40 years ago for a similar purpose but on a much more limited scale.

The deaths from diphtheria show an increase recently. In 1926 there were 5, in 1927 21, and in 1928 42. The case fatality per cent. during these three years has been 5·2, 11·3, and 16·7. Immunisation has been recently adopted for the nursing and domestic staff of the hospital, and is being pushed at the welfare centres and in selected schools. The notifications of encephalitis lethargica numbered 8 and the deaths 11. There were 116 definitely known cases of small-pox. One 9-year-old girl, who had a very mild attack with other members of her family, developed acute primary pneumonia, which proved fatal, a few days after admission to hospital.

Derby.

Dr. Albert E. Brindley says the most unsatisfactory statistical fact is the increase in maternal mortality. The death-rate from puerperal sepsis alone was 3·0 per 1000 births. Antenatal work is only on a small scale as yet; the clinic was attended by 297 expectant mothers and the total births in the borough were 2679. Dr. Brindley objects to the term "filth-disease" being applied to small-pox, as it has affected some of the cleanest persons living in the cleanest houses in the town, and the use of the term may not only cause distress to sufferers but lead to concealment of cases. He mentions that counsel for one of the property owners at a recent improvement scheme inquiry tried to make a strong point of the fact that no small-pox had occurred in the area. There were 212 known cases of small-pox and no deaths during 1928. The corporation, in their 1929 Bill, are seeking powers to require information to be furnished under a penalty, when such information is deemed necessary for preventing the spread of small-pox and other infectious diseases.

In the recently added area 30 samples of well water from 28 wells were examined and only 3 were reported as fairly satisfactory for drinking purposes. The new houses erected during the year numbered 198, of which 63 were municipal. Pitiful applications continue to be received at the Health Office for municipal houses, and many cases of overcrowding come to the knowledge of the inspectors in visiting notified infectious diseases. During the year the corporation made a first attempt to deal with two slum areas. The first area comprised 120 houses with 482 occupants; the second 86 houses with 379 occupants. The intention was to rehouse the displaced tenants. The inquiry was held in October, but unfortunately, owing to legal difficulties, the efforts of the corporation have been, for the time being, at any rate, nullified. At the beginning of 1928 there were about 1700 objectionable tub or pail closets. These have now been practically all dealt with, the corporation paying a subsidy of £8 each for their conversion into water closets. Dr. Brindley again records the need for new premises for the health offices and for adequate and suitable accommodation for maternity and child welfare work.

Preston.

Dr. F. A. Sharpe points out that the main attack is no longer on the environment and that even the slum problem is a comparatively minor one in Preston, the chief aim being to see that a vast amount of rapidly ageing working-class property is maintained in reasonable condition. Work in the interest of the individual will receive, he says, a fresh inspiration and impulse from the Local Government Act of 1929. The care of the poor and their medical treatment will be in the hands of one authority, and there will be unification of public medical services and coördination of hospital treatment and of medical services for infants, mental defectives, and blind persons, opening out fresh fields of endeavour. At present the various departments are separately housed, and the outstanding need is the creation of a central office in which the administrative work of all branches can be organised and controlled.

The houses erected since 1911, numbering 3793, are more than sufficient to contain the natural increase of the population on the basis of 4·3 persons per house, which was the density at the 1921 census. Notwithstanding, bad housing conditions are to be found. When the corporation build houses they finish the roads, but this is not the case for private enterprise houses. The majority of persons who have bought "private" subsidy houses have stretched their resources to the utmost to do so, and many are not in a position to face the cost of road dedication, but in the absence of proper roads their property is bound to deteriorate. Less than 4 per cent. of the milk is produced in the borough. The biological examination of 257 bulk samples of milk showed that 28, or 10·9 per cent., were tuberculous. Dr. Sharpe shows that the present method of following up tuberculous milk samples is no incentive to the outside farmers to produce tubercle-free milk. One of the 28 tuberculous samples was from a farmer, who had already been twice dealt with. When his farm was visited in 1928 two tuberculous udders and one cow with advanced tuberculosis were found. These animals were obviously diseased and should have been notified under the Order.

The births in the borough numbered 1916 and the expectant mothers who attended the antenatal clinic were 341, of whom 85 were sent by midwives. An arrangement is now in force by which if a midwife-sent case has to be referred to hospital the midwife receives half her fee as compensation. Four midwives were so compensated during the year. A questionaire sent out during the year brought out much difference of opinion among medical practitioners and others as to whether prolonged industrial depression has affected the health of working-class mothers. The school report shows the need for the increase of the dental staff, and that the orthopædic scheme begun in the autumn of 1927 has done a satisfactory year's work.

Northampton.

Dr. Stephen Rowland reports that the chief interest has been centred in the small-pox outbreak which began in July, 1928, and is still in existence in the middle of 1929. During 1928 there were 82 cases with no deaths, and up to June, 1929, there had been altogether 450 cases. Dr. Rowland's experience suggests that vaccination confers immunity for at least 20 to 25 years, and that cases unrecognisable by their mildness may cause the disease in others in a much more severe form. Bacterial examination of the water-supply showed an unexplained increase in coliform organisms during the later months of the year. Dr. Rowland comments on the fact that it is quite common for persons suffering from active tuberculosis to marry. He cites one example, where a young married woman in the last stage rose from bed to attend the wedding of her sister, also suffering from active phthisis. The first-named died a few days after the wedding, her death being followed a few weeks later by that of her child from tuberculous meningitis. An X ray apparatus is needed at the dispensary for diagnosis and for the control of artificial pneumothorax. No attempt at the clearance of any large slum area has been possible. Of 24 houses condemned during 1928 14 were still occupied at the end of the year, owing to the lack of other accommodation. Dr. Rowland points out that when a closing order is made the tenants are in no hurry to leave as they are able to live rent-free.

Paisley.

Dr. G. V. T. McMichael describes a gallant fight against overwhelming odds. The proportion of one- and two-roomed houses is 63·4 per cent. A survey of 3083 of the oldest houses towards the end of the year showed that more than 25 per cent. were overcrowded, some of them being occupied by two or three times the number of persons they were fitted to accommodate. The average inclusive rent of a one-roomed house is 16*s.* per month, and of a

two-roomed 25*s*. per month, and many of the occupants are not in a position to pay much more. 362 of the houses inspected were only fit for demolition. After considering a report on these lines the burgh council decided to proceed with a scheme for 200 two-roomed houses to be let at rents which the lower paid working-classes can afford. Another difficulty confronting the health department is that the clinics are overcrowded, and that the medical staff is inadequate for the provision of the extra sessions needed. The child welfare centres are being used as out-patient departments, and in Dr. McMichael's opinion the only remedy is the extension of the insurance service to dependents. One of the bright spots is Barshaw Municipal Maternity Hospital, which provides ample accommodation for both antenatal and labour cases. More mothers need to be attracted to the antenatal clinics, and a separate postnatal clinic is required for them. More dental work is wanted especially among the pre-school children whose teeth are "in a deplorable state." The present arrangements do not attract female patients to the V.D. clinic, and Dr. McMichael suggests that an extra session should be provided in the evening. The provision of a joint county sanatorium for non-pulmonary tuberculosis and the substitution of an up-to-date isolation hospital on the outskirts for the old burgh fever hospital have been long awaited but are now apparently approaching realisation.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 5TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 97 (last week 108); scarlet fever, 2913; diphtheria, 1402; enteric fever, 83; pneumonia, 853; puerperal fever, 45; puerperal pyrexia, 107; cerebro-spinal fever, 2; acute poliomyelitis, 29; acute polio-encephalitis, 4; encephalitis lethargica, 15; dysentery, 25; ophthalmia neonatorum, 116. No case of cholera, plague, or typhus fever was notified during the week.

The notifications of small-pox this week, as three weeks ago, are again below the 100 level which has been maintained since September, 1928.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 7th–8th was as follows:—Small-pox, 141 under treatment, 4 under observation (last week 143 and 10 respectively); scarlet fever, 1999; diphtheria, 1969; enteric fever, 27; measles, 165; whooping-cough, 163; puerperal fever, 25 (plus 9 babies); encephalitis lethargica, 125; poliomyelitis, 6; "other diseases," 15. At St. Margaret's Hospital there were 18 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox or enteric fever, 13 (3) from measles, 4 (1) from scarlet fever, 30 (4) from whooping-cough, 34 (9) from diphtheria, 189 (41) from diarrhœa and enteritis under two years, and 32 (7) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa (the number of which has now reached its fastigium) 17 were reported from Birmingham, 15 from Hull, 11 from Liverpool, 9 from Middlesbrough, 7 each from Salford and Leeds, 6 each from Manchester and West Ham, while Glasgow, Dublin, and Belfast reported 9, 8, and 16 respectively.

The number of stillbirths notified during the week was 269 (corresponding to a rate of 43 per 1000 births), including 53 in London.

A NEW SUNDERLAND HOSPITAL.—A new Monkwearmouth and Southwick hospital to contain 120 beds is about to be built at Sunderland at a cost of about £95,000. Sir John Priestman, shipbuilder and chairman of the hospital, who has already given £5000 towards the building fund, has announced that he will give a further £10,000.

Correspondence.

"Audi alteram partem."

GENERAL MEDICAL COUNCIL.

ELECTION OF DIRECT REPRESENTATIVES FOR SCOTLAND.

To the Editor of THE LANCET.

SIR,—The Registered Practitioners of Scotland will shortly be called on to elect a Direct Representative to the General Medical Council, and we, the undersigned, have ascertained that Sir Norman Walker, who has served with so much acceptance as our Representative for over 20 years, is willing to submit himself again as a candidate.

We recall with satisfaction the record of valuable and responsible work which he has achieved as our Representative. That he is a valued member of the Council is shown by the many important positions he occupies, and the special Missions with which he has been entrusted. On the Council he is Chairman of the Business and of the Examination Committees, and a member of the Executive, Finance, and Penal Cases Committees. In 1927, on the invitation of the Government of India, he visited for the second time the Medical Colleges and Universities of that Country, and reported on the progress made since his first visit in 1922; and last year, on the invitation of the Council of Medical Education and Hospitals of the American Medical Association, he revisited the United States, delivered Addresses on Medical Education and on Medical Registration and Legislation in Great Britain and in the British Dominions, and took part in the deliberations of their Annual Conference.

As Chairman of the Examination Committee he had important duties in connexion with the last Official Inspection of the Final Examinations of all the Licensing Bodies in this Country in Medicine, Surgery, and Midwifery, and should he again be returned as our Representative, it is probable that these will be again entrusted to him in connexion with the new cycle of Inspection which begins next year. We therefore venture to suggest to our medical colleagues in Scotland that Sir Norman's candidature might well be afforded our hearty support at this election.—We are, Sir, yours faithfully,

C. E. DOUGLAS (St. Andrews).
P. T. HERRING (St. Andrews).
D. WATERSTON (St. Andrews).
D. E. DICKSON (Lochgelly).
J. MACDONALD (Cupar).
J. J. WILSON (Anstruther).
A. L. CURROR (Kirkcaldy).
J. LANGWILL (Kirkcaldy).
G. WILLIAMSON (Aberdeen).
J. MARNOCH (Aberdeen).
J. F. CHRISTIE (Aberdeen).
J. B. SIMPSON (Golspie).
J. MURRAY (Inverness).
D. LAING (Arbroath).
R. STIRLING (Perth).
T. K. MUNRO (Glasgow).
W. H. BROWN (Glasgow).
G. R. LIVINGSTON (Dumfries).
M. B. STEUART (Kirkcudbright).
J. P. BROWN (Campbeltown).
P. F. MACFARLAN (Stirling).
W. E. TELLET (Paisley).
W. F. BROWN (Ayr).
G. L. GULLAND (Edinburgh).
J. PLAYFAIR (Edinburgh).
R. THIN (Edinburgh).
H. J. STILES (Gullane).
D. INCH (Gorebridge).
P. J. HENDERSON (Galashiels).
R. C. LOW (Edinburgh).
R. S. MCKERRON (Aberdeen).
D. HUSKIE (Moffat).

MALIGNANT TUMOURS IN THE FOWL.

To the Editor of THE LANCET.

SIR,—I was much interested in the article on this subject by Dr. A. M. Begg and Dr. W. Cramer in your issue of Oct. 5th. My experience certainly supports the view of these workers that the production of fowl sarcomas of the type Rous No. 1 by embryo emulsion and chemicals, as reported by Carrel and other workers, owes its success to contamination by tumour material. I have made repeated attempts to produce tumours by the inoculation of fowls with embryo pulp and arsenious acid; in no case has a malignant tumour been produced by this means. In this laboratory we always keep a supply of a dozen

or so small sterile mortars for grinding up tissues, and all the apparatus used is sterilised by heat; this fact has, no doubt, accounted for the lack of success in the production of tumours with arsenic.

We have had, up to the present, probably about 2000 birds with experimental tumours, chiefly Rous sarcoma No. 1, through this laboratory, and on two occasions the tumour has appeared on birds which had not been inoculated experimentally. These birds developed tumours (Rous No. 1) on the head, and the infection could be attributed to inoculation by a peck, since they had been in a pen in which there was a bird with a superficial tumour which had become ulcerated and been pecked by other fowls.

Considering the ease with which a tumour can be produced by a minute quantity of material from a virulent sample of this sarcoma, it is rather surprising that there is so little evidence of infectivity in laboratories where considerable numbers of tumour-bearing fowls are housed. This absence of infectivity may perhaps be accounted for by the fact that the tumour material, either as a filtrate or in the form of small particles, loses its activity comparatively rapidly on exposure to air.—I am, Sir, yours faithfully,

S. L. BAKER.

Bland-Sutton Institute of Pathology, Middlesex Hospital, London, W., Oct. 8th, 1929.

ANAEROBIC TOXÆMIA IN ACUTE OBSTRUCTION.

To the Editor of THE LANCET.

SIR,—When the demonstration of Harvey, that the blood goes round and round, is recognised as being something more than an interesting phenomenon; when students of medicine really come to grasp that the flow of blood through the tissues matters to any part in question as to the individual as a whole: then, perhaps, medicine will begin to make that advance which is long overdue. At present, unhappily, such a circumstance seems to be completely disregarded. The effect of the interference to the blood-flow through the intestine—and thus through the portal vein and liver—in acute intestinal obstruction, caused on the one hand by the specific effect of the obstruction on the proximal part of the gut affected, and on the other by the effect of the straining, the tenesmus, and especially of the vomiting on the blood-flow through the whole gut and through the liver, is unconsidered by those concerning themselves with the genesis of the toxæmia arising in this state. Thus in your annotation of Oct. 5th (p. 724) no mention is made of this disturbance or of its possible effect.

No one who has had under his care a case of acute intestinal obstruction, who has watched the patient in the earlier part of the illness, has seen the operation, or inspected the patient subsequently during the recovery or at the post mortem, can have failed to recognise that in this disease physical forces are in predominant play. The disease is caused by a physical impediment; recovery depends on the removal of that cause, not on the administration of antitoxins. The reaction of the patient, his behaviour, during the illness prior to operation is one of constant and violent physical response; the patient does not lie quietly in bed, as though he were suffering simply from a rising toxæmia. He reacts greatly, constantly striving to empty the rectum, constantly straining to bring up the voluminous and ever-increasing contents of the stomach. And this goes on when the doctor is not there, all through the day and all through the night. But, according to writers on the subject, these factors do not matter, do not come into the account of a rising toxæmia, of a disturbance profoundly affecting the system, sufficing by themselves to cause exhaustion and death.

What we want is a lesson on "exhaustion" and its causes; what we want is to be taught the value—nay, the necessity—of sleep. It is plain we do not know yet the significance of either. In intestinal obstruction the student who has not yet his own reserves of observation to rely on has been taught, and perhaps is still taught, that the toxæmia of the patient—the cause, obviously, of the exhaustion and certainly of the death—is due to the rise of the *B. welchii* in the intestine; as though that mattered, as though when vital forces are ebbing the whole body does not tend to become or does not become invaded with micro-organisms. Is it not a tragedy to regard a complication as the primary cause of a disease? to use a hypodermic syringe when the only remedy is the knife? For such at least, though it may not be acted on, is the only logical conclusion of such instruction.

Some years ago I gave reasons for the view that the physical reaction of the patient plays an all-important part in the rise of the toxæmia, and showed how erroneous are the interpretations of some experimental data.[1] To the reasoning I there adduced comes now evidence to which you refer in your annotation. Certain authorities, it is stated, have repeated experiments purporting to show that the *B. welchii* or its toxins play a great part in the toxæmia, and have failed to find confirmatory evidence. Thus you declare that ". . . the original theory of intestinal absorption (of toxins) requires confirmation before it can be held to be established." The value of injecting antitoxins, you state, "has not so far been denied." My reply to that is that the value of such injections, either apart from operation or with it, has not yet been shown. If "the theoretical basis of the method, already resting on two contradictory arguments, is decidedly uncertain," I can only believe that the theoretical basis is unsound.

I am, Sir, yours faithfully,

R. H. PARAMORE, F.R.C.S. Eng.

Rugby, Oct. 5th, 1929.

THE HEALTH OF SEAMEN.

To the Editor of THE LANCET.

SIR,—The Seamen's National Insurance Society has a membership (as stated on p. 782 of your last issue) of 60,000, and its statistics will not be thought by anyone to be other than accurate. It occurs to me, however, that there is danger in concluding that the deaths and illnesses of all seamen are similar to those of the 60,000. There were 129,289 British seamen in the Board of Trade's quinquennial census, last taken on March 31st, 1926, and that makes no allowance for men on leave or waiting for ships, the 129,289 being the figure of men actually employed on that day, British seamen on British ships—twice as many as the number of members claimed by the Society.

I am, Sir, yours faithfully,

Oct. 14th, 1929. W. E. HOME.

PROBLEMS OF EPILEPSY.

To the Editor of THE LANCET.

SIR,—My attention has been drawn to a leading article which appeared in THE LANCET for July 6th (p. 27), in which the present-day knowledge of epilepsy was ostensibly reviewed. I find it remarkable that no reference was there made to my theory that epileptic phenomena have their origin in a physiological phenomenon, a theory discussed fully in my book.[2] Although changes in the metabolic products of the body, both excreta and secreta, have been described over and over again in epileptics, subsequent work has always shown that such alterations in metabolic products occur in normal individuals, and do not stand in any direct relation to the epileptic discharges.

Even if theoretical points be waived, the deductions drawn from their consideration and presented in your leading article are, in my opinion, definitely dangerous. The contention that the administration of bromides to

[1] The Toxæmia of Acute Intestinal Obstruction: or Vomiting as a Pathological Force. Lewis and Co. 1923.

[2] Epilepsy. London: Baillière, Tindall and Cox, London, 1928.

epileptics is harmless, because the drug does not have the deleterious effect on them which it has on normal persons, is quite without proof. If we have learned one thing in the treatment of epilepsy, it is that the prescribing of bromides in cases of incipient epilepsy or where the epilepsy is but of short duration is to be avoided as long as possible. It is only when all efforts at controlling the fits by hygienic measures have failed that we are justified in assuming the serious responsibility of prescribing bromides.

I am fully convinced that it is highly dangerous to suggest that bromides can be administered freely to epileptics. Such statements tend to encourage practitioners to give bromides in early cases where the drug can do infinite harm to the patient.

I am, Sir, yours faithfully,

L. J. J. MUSKENS, F.R.S.M.

Amsterdam, October, 1929.

*** Dr. Muskens will recognise that it was impossible within the limits of a leading article to cover the whole field of epilepsy; his views received recognition in the review of his book which appeared in THE LANCET, 1928, i., 1284. The idea that bromide is harmful in mild cases of epilepsy is not accepted by clinicians in this country.—ED. L.

FORCEPS AND THE SIZE OF THE HEAD.

To the Editor of THE LANCET.

SIR,—In Mr. G. F. Gibberd's contribution to the study of the maternal death-rate (THE LANCET, Sept. 14th, p. 535) he refers to the increase during recent years of obstetric interference and he mentions that the forceps rate is now ten times what it was 60 years ago. I was recently informed by an elderly assistant in a large outfitting shop for boys that nowadays boys take a larger size in hats than they did when he was a young man. It would be interesting to know whether any general increase in the size of infants' heads has been observed. If so, this may be one of the causes of increased interference.

I am, Sir, yours faithfully,

F. S. D. HOGG.

Rickmansworth, Herts, Oct. 13th, 1929.

ANÆMIA IN SCHOOL-CHILDREN.

To the Editor of THE LANCET.

SIR,—In her report of an investigation of anæmia in school-children (THE LANCET, Sept. 14th, p. 550), Dr. Nancy Gibbs remarks on the discrepancy between the hæmoglobin percentages found by Dr. Helen Mackay and herself, after administering iron and ammonium citrate. I would suggest that the two inquiries are hardly comparable, as the ages of the children examined must have been different. Dr. Mackay's cases were mostly under one year of age, and on a milk diet, which does not contain enough iron to maintain a normal hæmoglobin level if the fœtal storage of iron has been defective or interrupted. These were true cases of iron deficiency or nutritional anæmia, and one would expect iron to cure the condition. On the other hand, Dr. Gibbs's cases were children of school age, presumably on a mixed diet, which should provide a sufficient ration of iron. The fact that additional iron did not, in most cases, cause an appreciable rise in the hæmoglobin percentage suggests that sufficient iron was already present, and that the anæmia in the child of school age is not a deficiency disease, but is probably due, as Pearson and Wylie suggest, to bad hygiene, bad teeth, insufficient sunlight, nervous strain, and the like. The fact that the children improved at the open-air school rather bears this out.

I am, Sir, yours faithfully,

FRANK BODMAN, M.B., M.R.C.S.,

Oct. 10th, 1929. Physician, Bruce Wills Memorial Hospital, Bristol.

SNAKE-BITE IN ENGLAND.

To the Editor of THE LANCET.

SIR,—"D. W. B.'s" letter in your issue of Oct. 5th (p. 744) reminds me of an early experience of my own. In the early spring of 1883, when a medical student at Bart.'s, I went with a fellow student to Epping Forest. At about 1 P.M. I saw what I took to be a slow-worm, and stooped to pick it up, and was bitten on my right forefinger tip. We caught the snake, which was an adder, and emptied its poison fangs. In about a quarter of an hour my finger began to swell in spite of sucking the wound and tying the finger tightly. Hurrying back to catch a train at 4 P.M. I felt very faint and had to sit down. I vomited and fainted in the train, and by the time we got to Bart.'s my right arm and forearm were swollen to twice their size. The following morning my right side was swollen to the crest of the ilium. I carried my arm in a sling for a week. Here there was no thrombosis, only exudation into the tissues. Presumably in "D. W. B.'s" case the inoculation was intravenous.

I am, Sir, yours faithfully,

Norwich, Oct. 8th, 1929. A. L. MARSHALL.

CERTIFICATION OF FITNESS FOR WORK.

To the Editor of THE LANCET.

SIR,—Many of the younger men in the profession are disgusted with the continual vilification of the certification of insurance practitioners. We have been roundly rated by everyone in contact with national health insurance work in the country—approved society officials, the press, and apparently all political parties. The statistics of certification are, of course, arrived at from the reports of regional medical officers (R.M.O.'s.) in England and Wales, and district medical officers (D.M.O.'s) in Scotland. This appears to be continued and intensive propaganda directed towards preparing the country for the establishment of a whole-time State service. In the area in which I practise the vast majority of the practitioners do not want a soft job in a whole-time service. They want freedom to carry on their work and to carve their own careers without that State interference which means the killing of all initiative and interest. We are getting rather tired of being lectured and treated like school-children. Two things we can do to clear ourselves:

(1) Put our own house in order.

(2) Work out the appeal service against the adverse findings of R.M.O. and D.M.O.

(1) It is common knowledge that the scallywag of the profession to-day is a canvasser, a high certifier, and possibly also a high prescriber. I understand that, in conjunction with the Ministry of Health, the Panel Conference, which meets in London on Oct. 24th, is to bring forward a scheme this month for dealing with high certification. If the canvasser is effectively dealt with a great deal can be done. The chairman of a recent Panel Conference declared that what could not be described otherwise than as wholesale canvassing was rampant in urban areas. Yet at the B.M.A. annual representative meeting this year a proposal by an urban division to hold disciplinary inquiries locally was lost by an overwhelming majority.

(2) At present there is virtually no appeal against the decision of the R.M.O. or D.M.O. The patient has no resources. He is dependent for everything on the society's weekly payment. D.M.O. says he is fit for work and his money stops. He can appeal, but how is he to live during the weeks or months his appeal is being considered? Naturally he asks for a line to get on the labour exchange, and his doctor as a rule is only too pleased to comply with the request. If one can persuade a patient to appeal what usually happens is this. He writes to his society intimating his desire to appeal. Sometimes his

letter is ignored. After some weeks he is told to appear before a lay person or official of another society. This person decides the appeal. If the patient is not bored to death with the whole proceeding, starving or dead, one may next in Scotland persuade him to appeal to the Department of Health. This entails filling up pages of official forms and further delay. I saw a woman this morning whose appeal is at this stage—three months less ten days since she was declared fit by the D.M.O.

I happened to meet a local magistrate the other day in connexion with an old age pension case. He was amazed at the way the profession submitted to the D.M.O.'s findings. He said "this man cannot always be right and the whole profession wrong." Recently I have tried to get every case of mine declared fit for work to appeal. Very few have been lost. There should be no reason why the patient should not be able to appeal practically immediately against the D.M.O.'s finding, and be medically examined by a board when he is in the same state of health.

The annual report of the Department of Health for Scotland states that in 1928 38,834 insured persons were sent for by D.M.O.'s for medical examination. It also states that there were only 31 appeals against the adverse finding of the D.M.O. These figures speak for themselves.

I am, Sir, yours faithfully,

ONE OF THE YOUNGER MEN.

Dundee, Oct. 14th, 1929.

BRITISH MEDICAL ASSOCIATION.

ANNUAL DINNER OF THE COUNCIL.

THE eighth annual Council dinner was held on Oct. 15th, the chair being taken by Dr. H. B. Brackenbury, Chairman of Council.

After the loyal toast had been honoured, "The Common Health" was proposed by Dr. E. H. Snell who observed that the present moment was an auspicious one for reviewing the subject, as the Registrar-General's Report—the standard account of the state of the public health—had just appeared. Most readers preferred detective stories to the parallel statistical columns in this Report, but the figures showed that the common health was highly satisfactory. With this achievement doctors had much to do, but voluntary teachers had played a part, although their usefulness might vary inversely as their perseverance. Dietetic faddists, medical and otherwise, offered constant advice on all subjects. It had recently been announced that drinking beer would entirely prevent cancer. The vegetarians said that, since the teeth of man resembled those of the monkey, both should eat the same food; it might, however, be the monkey which had made the mistake. Another helpful authority had recently announced in the press that there was enough poison in 20 cigarettes to kill a full-grown rabbit. This might be why a full-grown rabbit was seldom seen smoking cigarettes. The guides to the public in health matters should be the medical men who visited the homes of the people. The most important health measure that had been passed in our time was school inspection. To many people the pros and cons of any argument were settled by the reply, "It is interfering with nature." But we were interfering with nature every day. A campaign against maternal mortality would succeed only by interfering with nature, for nature's way of reproducing species was very wasteful, and she was impartially anxious about the increase in babies, beetles, bluebottles, and boa constrictors.

Mr. Arthur Greenwood, Minister of Health, replying to the toast, referred to the medical officers of health as outposts of the Ministry, engaged on a variant of the same work as the rest of the profession, and to himself as the common man, the man in the street. The interests of the man in the street were what the profession had to serve, and in so doing it worked for its own extinction. We had succeeded in diminishing infant mortality, stamping out certain diseases, and increasing the length of life. This was a tribute to the doctors and the public services. In the long run the interests of the doctors, the Government, and the man in the street were common. The eyes and ears of the public health service were found in the general practitioner who entered the homes of the people. The medical profession was fighting an uphill fight. The campaign against maternal mortality was not against nature, but against complications introduced by highly civilised life. He would like to see an organisation of resources so that all concerned should coöperate to protect what lay at the basis of all civilisation. There could be no civilisation with any kind of spiritual ideals except on a basis of sound physical health. The function of the medical profession transcended the individual, and had to do with the creation and maintenance of life. This country would never be in danger of becoming bureaucratic. A Ministry of Health run without regard to the medical profession would be cut off from all practical experience. The Minister of Health should represent the man in the street with whom the Ministry had to deal, but he could never dispense with the knowledge and experience of the doctors. Despite all the figures quoted by Dr. Snell, the health of the country was not worthy of an imperial race; it presented a tremendous and frightening problem. Since its inception the Ministry had had to devote its energies to questions that were only ancillary to the main problem: that of arousing the public health spirit. Tuberculosis could be stamped out in a generation with an enlightened public opinion. The people had not yet realised that prevention was better than cure; we had not broken the worship of the "bottle of medicine." The problem of public health was a problem of education.

Major Walter Elliot referred to the Brighter London scheme adumbrated by the First Commissioner for Works, and extended the idea of public sunbathing to Dr. Snell, Mr. Greenwood, and himself, as well as to other public men, recalling the classical example of Lady Godiva. He suggested that we took ourselves too seriously; most people disregarded the good advice given them, and got on very well. The great work for public health would have to be done in the future as in the past by the rank and file of the profession, in close coöperation with the civil service. We had to attend more and more to the normal man, woman, and child, and not concentrate on the abnormal.

Mr. W. McAdam Eccles proposed the toast of "Kindred Societies," including the Royal Society, the Royal Colleges, the Royal Society of Medicine, the Medical Society of London, the Medical Women's Federation, the Society of Apothecaries, the British Dental Association, the Pharmaceutical Society, the Royal Medico-Psychological Association, and the Royal College of Veterinary Science, as well as many ancillary kindred societies. To all these medicine owed much, as well as to her more distant relatives, for example, the accountants, the architects, the journalists, and the jurists.

Dr. Andrew Balfour, replying, attributed his position of representative of all these societies to his post as director of the London School of Hygiene and Tropical Medicine, the Benjamin of them all, and an institution which included in its staff members of all branches of the profession, and of all the kindred societies. Both the School and the Society owned new rooms in Bloomsbury; each had administrative rooms; each had a refectory. The School had a museum; the Association could found one if it were to display its correspondence files. The real kinship, however, lay

in aim and object: furtherance of the cause of science for the welfare of mankind.

Lord Riddell, also replying, expressed his anxiety at having to respond for so many societies, and had come to the conclusion that if he replied for one he would reply for all. After prolonged research he had concluded that no societies had done more to advance the cause of science, or the cause of dining and wining, than the societies represented there.

The health of the Chairman was proposed by Dr. R. L. Langdon-Down, who attributed Dr. Brackenbury's position to his loyalty to an abiding principle: that the welfare of the profession and of the public health were one and the same.

Dr. Brackenbury briefly replied.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At recent examinations the following candidates were successful:—

DIPLOMA IN PUBLIC HEALTH AND DIPLOMA IN HYGIENE.

Part II.—W. J. C. Auld, G. L. Chadha, Bessie G. Jemson, *A. P. Martin, R. M. Mathew, L. N. Mathur, Isabel D. Patterson, R. S. Sandhu, S. W. Savage, A. G. Shanks, and L. R. Sharma.

* With distinction.

UNIVERSITY OF DUBLIN.—At a recent examination the following candidates were successful:—

FINAL MEDICAL EXAMINATION.—PART I.

Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Pathology and Bacteriology.—*G. F. Ennis, *G. A. Wray, *Brian O'Brien, *A. A. Cunningham, A. J. Harden, M. G. Leane, O. W. S. Fitzgerald, H. V. Tighe Marjorie L. Campbell, *A. D. Barber, *T. J. O'Sullivan, *Annie E. Thompson, A. D. Egan, J. A. Page, C. M. Elliott, T. H. Dockrell, R. D. Scott, and W. M. E. Anderson.

Passed on high marks.

SOCIETY OF APOTHECARIES.—On Oct. 8th the outgoing Master of this Society, Lieut.-Colonel C. T. Samman, was placed in office for a second term in recognition of his achievements in developing the work of the Guild. After a service at St. Andrew's-by-the-Wardrobe, the Master's dinner was held in the Society's hall in Water-lane, which has now been saved from the threatened destruction by the death-watch beetle. Dr. Thomas Wakefield proposed the Master's health, and in his response Colonel Samman spoke of the efforts being made to bring the Society into the forefront of medicine.

ROYAL SOCIETY OF MEDICINE: *Colyer Prize.*—In 1926 a prize was founded to commemorate the 25 years' service of Sir Frank Colyer as honorary curator of the Odontoiogical Museum. It may be given every third year in recognition of original work in dental science completed during the previous five years by a dental surgeon educated in Great Britain or Northern Ireland who has not been qualified to practise more than five years at the date of the award. Applications for the first award should be submitted in due form not later than March 31st, 1932. The value of the prize will be about £35.

Particulars of the *annual dinner* will be found on p. 836.

ROYAL COLLEGE OF SURGEONS OF ENGLAND—A quarterly meeting of the Council was held on Oct. 10th, with Lord Moynihan, the President, in the chair. Membership of the College was conferred on:—

C. S. Kah, Cambridge and St. Thomas's; D. Sheehan, Manchester; P. D. B. Spence, Guy's; F. R. Stansfield, Leeds; E. H. Parkinson, Birmingham; and T. J. Millin, Dublin.

It was reported that, at the Primary Examination for the Fellowship held at Toronto in August last, the following candidates had been successful:—

J. H. Beasley, Toronto; J. M. Bruner, Johns Hopkins and Rush Medical Coll.; G. A. Fleet, McGill; F. L. Horsfall, McGill; H. D. Isaacs, Manitoba; R. Marnham, Camb., St. George's, and King's Coll.; H. J. Muth, Saskatchewan; L. R. Olver, Sydney and St. Bart.'s; and V. N. Shirodkar, Bombay and Middlesex.

It is proposed to hold a Primary Examination for the Fellowship at Montreal next year.—Mr. Hugh Lett was elected a member of the Committee of Management of the Conjoint Examining Board.

On the recommendation of the Board of Examiners in Dental Surgery it was decided that after July, 1930, candidates for the Licence in Dental Surgery be required to pass in elementary biology (Part II. of the pre-medical examination) as required of candidates for the M.R.C.S. and L.R.C.P. Not more than two terms' work in dental mechanics will be recognised before Part II. of the pre-medical examination is passed, and no instruction in anatomy and physiology will be recognised before the pre-medical examination has been completed—i.e., chemistry, physics and biology.—The University of Cairo, Dental Department, was added to the list of recognised Dental Schools at which the curriculum for the Licence in Dental Surgery may be taken.

Estimates for alterations and additions to the museum workrooms and laboratories were received and approved, and the architect was instructed to take steps for carrying out the work forthwith.—On the recommendation of the Library Committee it was decided to buy a new edition of the "Encyclopædia Britannica."—The annual report of the Council, to be presented to the Fellows and Members at the annual meeting on Nov. 21st, was approved.

The President reported that the Bradshaw lecture on a Review of the Surgery of the Gall-bladder and Bile-ducts would be delivered by Mr. R. P. Rowlands on Nov. 14th at 5 P.M.—The President reported that he had received from the Public Trustee a cheque for £10,000 for the legacy bequeathed to the College by Mrs. Eliza Macloghlin for scholarships to be founded in memory of her husband, the late Mr. E. P. P. Macloghlin, M.R.C.S. A committee was appointed for putting into operation the scheme for the award of the scholarships.—The President reported that he had received an offer from Lord Melchett of a gift of £500 a year for a period of seven years for a research scholarship in the College of Surgeons, and a resolution expressing grateful appreciation of Lord Melchett's liberality was adopted.

UNIVERSITY OF LONDON: *University College.*—A course of 19 post-graduate lectures in Biochemistry started this week and will continue throughout the session on Thursdays and Fridays at 4 P.M. Particulars may be had from the secretary of the College, Gower-street, W.C.1.

MEDICO-LEGAL SOCIETY.—A meeting of this Society will be held at 11, Chandos-street, Cavendish-square, W., on Thursday, Oct. 24th, at 8.30 P.M., when Lord Riddell will deliver a presidential address upon Ancient Laws and Modern Women.

The annual dinner of the Society has been fixed for Friday, Dec. 13th, at the Holborn Restaurant.

CHELSEA CLINICAL SOCIETY.—The annual dinner will take place at the Hotel Rembrandt, Thurloe-place, London, S.W., next Tuesday, Oct. 22nd, at 8 P.M. (reception at 7.30). Mr. A. Rugg-Gunn and Mr. H. P. Baylis are the hon. secretaries.

HUNTERIAN SOCIETY.—This Society has invited members of the Medico-Legal Society to attend a discussion on the Doctor and the Motorist at 9 P.M. on Monday, Nov. 18th, at the Cutlers Hall, Warwick-lane, London, E.C.

NATIONAL COUNCIL FOR MENTAL HYGIENE.—As we have already announced, a conference on Mental Health will be held in the Central Hall, Westminster, from Wednesday, Oct. 30th, to Saturday, Nov. 2nd. Further information may be had from the secretary of the Council at 78, Chandos House, Palmer-street, London, S.W. 1.

GUILD OF ST. LUKE.—As we announced last week the Guild's annual service will be held in Westminster Abbey on Sunday next, Oct. 20th, at 6.30 P.M. The secretary is Dr. Andrew Currie, 20, Oxford-terrace, London, W. 2.

ROYAL ACADEMY OF MEDICINE IN IRELAND.—At the annual meeting of the Academy on Oct. 11th it was stated that the year had been one of unusual activity, the number of Fellows on the books and the attendance at meetings having increased. The chief event of the year was the Obstetrical and Gynæcological Congress held under the auspices of the Academy. The principal officers for the ensuing session are: President, Sir William Taylor; General Secretary and Treasurer, Dr. T. P. C. Kirkpatrick; Secretary for Foreign Correspondence, Mr. W. Doolin; Presidents of Sections: Medicine, Prof. R. J. Rowlette; Surgery, Mr. R. A. Stoney; Obstetrics, Dr. A. H. Davidson; Pathology, Dr. J. Lait; State Medicine, Dr. W. D. O'Kelly.

POST-GRADUATE WORK IN GLASGOW.—A programme including weekly demonstrations, and special courses in ophthalmology, obstetrics, and diseases of the ear, nose, and throat, has been arranged for the winter session, and particulars may be had from the secretary of the Post-Graduate Medical Association at the University. Clinical assistantships are available at various institutions.

WEST HARTLEPOOL ISOLATION HOSPITAL.—After long deliberation West Hartlepool Town Council has decided to erect an isolation hospital at a cost of £42,000.

THE Surgical Instrument Manufacturers' Association held their annual dinner at the Holborn Restaurant on Oct. 11th. The chair was occupied by Mr. Patrick C. Maw, who received the guests with Mrs. Maw (senior). In accordance with custom the chairman drank wine with the members of the separate sectional committees and of the main committee. After the loyal toasts Mr. H. E. Curtis, seconded by Mr. A. W. Down, proposed the health of the Association and chairman, and Mr. Maw responded. Colonel A. Young proposed the health of the guests, and Mr. Charles E. Goulden spoke in reply.

MOTOR ACCIDENTS AT EDINBURGH.—During the year ended with Sept. 30th 443 cases of accidents caused by mechanically propelled vehicles were admitted. The cost of treatment was £3223, and the patients' aggregate stay was 7894 days.

THE FOUNDER OF HOSPITAL SATURDAY.—The Earl of Meath died in London on Friday last week at the age of 88. As Lord Brabazon he founded in 1874 the Hospital Saturday Fund, of which he was the first secretary. The amount collected in the first year was £6403; the annual collection now exceeds £100,000. Lord Meath also founded the Dublin Hospital Sunday movement.

COSHAM HOSPITAL INQUIRY.—The public inquiry, which was ordered by the Ministry of Pensions into the administration of the Ministry's hospital at Cosham, ended at Portsmouth last week. Sir Frederick Willis presided. On the last day of the inquiry evidence was given by the three chaplains to the hospital—the Rev. J. W. Watson, the Rev. A. J. Craig, and the Rev. F. E. Stainford—who described the administration as "most satisfactory," "quite good," and "most competent." Mr. C. H. Marsh, a magistrate who frequently visits the hospital, said that the patients always spoke well of their treatment, and Mr. F. Melling, the welfare officer, described the many recreational facilities enjoyed by the inmates. Sir Frederick Willis, who said that he had been much struck by the good work done in the hospital workshops, pointed out that although the coroner's jury had specifically found that there was maladministration, none of those responsible for the statements upon which that opinion was formed had come forward to substantiate them.

BRITISH EMPIRE CANCER CAMPAIGN.—In the absence of Lord Reading, Sir John Bland-Sutton presided on Oct. 14th at the quarterly meeting of the Grand Council of the Campaign. The Council renewed the grant to the Cancer Hospital for radiological research on the effect of X rays upon the blood constituents and bone-marrow. A further grant of £250 for one year was also made to Mr. E. Nevill Willmer for the continuation of his research work on the relation of the chemical nature of the media in which cultures grow to the growth of the cultures. Mr. Willmer formerly worked at the University of Manchester but has now been appointed lecturer in the Physiological Department of the University of Cambridge.

A report from the Finance Committee showed that grants made by the Campaign during the last year for research purposes amounted to approximately £25,000, whilst donations received during that period only amounted to about £17,000. The Finance Committee asked that special efforts should be made to increase donations so that the cancer research centres could be kept at their maximum activity.

The general secretary reported that details of the policy which the National Radium Commission proposed to adopt, relative to the coördination of existing bodies interested in the use of radium, had not been so far communicated to the Campaign. The Grand Council expressed a hope that early steps would be taken to bring about coördination between the work of the National Radium Commission, the use of the radium in the hands of King Edward's Hospital Fund, and the various radium centres in existence which have been formed by the Campaign.

It was reported that the North of England Council of the British Empire Cancer Campaign, combining the counties of Northumberland, Durham, Cumberland, and Westmorland, had been founded under the presidency of the Duke of Northumberland, with Sir Thomas Oliver as chairman of the executive committee.

A CONFERENCE ON WATER-SUPPLY AND POLLUTION.—The British Waterworks Association is arranging conferences on Thursday, Nov. 21st, during the holding of the Public Works, Roads and Transport Congress and Exhibition at the Royal Agricultural Hall, London, N. In the morning, at 11 A.M., Mr. G. L. Pepler, chief town-planning inspector of the Ministry of Health, will read a paper on Water-supply as a Factor in Town and Regional Planning. At 3 P.M. a paper on the Purity of Drinking Waters from the Biological Aspect will be given by Dr. Wilfrid Rushton, of the Biological Department of St. Thomas's Hospital Medical School; and Dr. J. B. Firth, of the Chemistry Department, University College, Nottingham, will make some observations on river pollution.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Oct. 22nd.—5 P.M., MEDICINE. Discussion on Diseases of the Pituitary Body. To be opened by Dr. W. J. Adie. Followed by Mr. Norman Dott, Prof. E. C. Dodds, Dr. O. Leyton, Dr. Macdonald Critchley, Mr. H. W. B. Cairns, and Dr. Oljenick. Members of the Section of Comparative Medicine are specially invited to attend this meeting and take part in the discussion. 5.30 P.M., General Meeting of Fellows.

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE. Presidential Address. Mr. Stewart R. Douglas: Some Recent Investigations into Virus Diseases.

THURSDAY.—8.30 P.M., UROLOGY. Presidential Address. Mr. Frank Jeans: Urological Statistics as a Criterion of Progress.

FRIDAY.—5 P.M., DISEASES IN CHILDREN. (Cases at 4.30 P.M.) 8 P.M., EPIDEMIOLOGY. Paper. Dr. S. P. James: Modern Aspects of the Epidemiology, Prevention and Treatment of Malaria.

MEDICO-LEGAL SOCIETY.

THURSDAY, Oct. 24th.—8.30 P.M. (at 11, Chandos-street, Cavendish-square, W.). Lord Riddell: Ancient Laws and Modern Women (Presidential Address).

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY, Oct. 21st.—5 P.M., Mr. Cecil P. G. Wakeley: Specimens Illustrating Tumours of the Brain.

FRIDAY.—5 P.M., Sir Arthur Keith: Dislocations of the Hip-joint, Congenital and Acquired.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Oct. 21st, to SATURDAY, Oct. 26th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., 5 P.M., Lecture by Mr. H. W. Carson: On Indigestion from the Surgeon's Standpoint. No fee. Tues., 8.30 P.M., Lecture by Dr. L. S. T. Burrell: Intrathoracic Tumours. Fri., 8.30 P.M., Lecture by Dr. L. S. T. Burrell: Bronchiectasis, Abscess of Lung and Empyema. Specially suitable for M.R.C.P. candidates.—ROYAL CHEST HOSPITAL, City-road. Tues., 2 P.M., Demonstration of Cases in Wards by Dr. Ernest Fletcher. No fee.—LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. Thurs., 2 P.M., Demonstration (general surgery) by Mr. Herbert Paterson. No fee.—THE METROPOLITAN HOSPITAL, Kingsland-road, N. Special post-graduate course in Medicine, Surgery, and Special Branches. Daily 10.30–5.30, demonstrations, operations, and lectures for two weeks.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Second week of course in gynæcology, afternoons and some mornings.—LONDON TROPICAL HOSPITAL, Gordon-street, N.W. Tues. and Thurs. afternoons, 2 P.M., Demonstrations.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. Second week of course in Diseases of Children. Mornings only.—CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C. Second week of clinical course in Diseases of the Throat, Nose, and Ear. All day. Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.6.

MONDAY, Oct. 21st.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Sinclair: Surgical Wards.

TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Shaw, Medical Out-patients. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.

THURSDAY.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department. 9.30 A.M.

SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose and Ear Operations. Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.

Daily, 10 A.M. to 5 P.M., Medical, Surgical and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Oct. 21st.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Oct. 21st.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Syphilis of Nervous System.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Bernard Hart: Disorders of Memory.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Just: Demonstration of Methods of Testing the Acoustic Nerve.

FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of the Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Sir Percy Sargent: Tumours of the Posterior Cranial Fossa.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham.

THURSDAY, Oct. 24th.—4 P.M., Dr. Hector C. Cameron: The Nervous Child.

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, Oct. 21st.—5 P.M., Dr. R. J. Brocklehurst: Secretion of the Digestive Juices. (Second of four public lectures.)

FRIDAY.—5.30 P.M., Mr. C. S. Elton: The Future of Animal Ecology. (First of three lectures.)

KING'S COLLEGE, Strand, W.C.

TUESDAY, Oct. 22nd.—5 P.M., Mr. J. W. Pickering, D.Sc.: Blood Plasma and Platelets. (Third lecture.)

THURSDAY.—5 P.M., Mr. J. A. Hewitt, D.Sc.: Metabolism of the Carbohydrates and Fats. (Second of four lectures.)

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL, Albert Embankment, S.E.

TUESDAY, Oct. 22nd.—5 P.M., Dr. A. St. G. Huggett: Physiology of the Fœtus. (Third lecture.)

KING'S COLLEGE FOR HOUSEHOLD AND SOCIAL SCIENCE, Campden Hill-road, W.

FRIDAY, Oct. 25th.—5 P.M., Prof. V. H. Mottram: Human Nutrition. (Second of six lectures.)

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Oct. 22nd.—5 P.M., Dr. H. W. Barber: Immunity and Anaphylaxis.

THURSDAY.—5 P.M., Dr. W. Griffith: Principles of Treatment.

ST. PAUL'S HOSPITAL, Endell-street, W.C.

WEDNESDAY, Oct. 23rd.—4.30 P.M., Mr. W. K. Irwin: The Diagnosis and Treatment of Some Important Bladder Conditions.

INSTITUTE OF HYGIENE, 28, Portland-place, W.

WEDNESDAY, Oct. 23rd.—3.30 P.M., Dr. Cyril Horsford: The Correct Training of the Voice as a Factor in Health.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Oct. 23rd.—4 P.M., Mr. J. C. Stobart: Broadcasting and Health.

FRIDAY.—5 P.M., Prof. R. A. Peters: Coördinative Biochemistry of the Cell and Tissues. (Second Harben Lecture.)

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Oct. 22nd.—4.15 P.M., Dr. F. R. Ferguson: Congential Neurosyphilis.

FRIDAY.—4.15 P.M., Dr. G. Jessel: Modern Methods in Treatment of Pulmonary Tuberculosis.

ANCOATS HOSPITAL, Mill-street, Manchester.

THURSDAY, Oct. 24th.—4.15 P.M., Dr. A. Renshaw: Cystological Changes in the Blood and their Significance

UNIVERSITY OF BRISTOL.

TUESDAY, Oct. 22nd.—8.30 P.M. (in the Physiological Theatre of the University), Mr. A. Rendle Short: Ten Years' Progress in Surgical Treatment (Long Fox Memorial Lecture).

Appointments.

FRASER, J. W., M.D., C.M. Edin., has been appointed Medical Officer of Health, Hull.

HOGG, C. B., M.D., Ch.B. Aberd., D.P.H., Medical Officer of Health, Kettering.

POLLOCK, A. M., M.B., Ch.B. Glasg., Certifying Surgeon under the Factory and Workshops Acts, Tunbridge Wells.

SCOTT, J. A., M.D., Ch.B. Liverp., D.P.H., Medical Officer of Health, Shipley.

Vacancies.

For further information refer to the advertisement columns.

Adelaide Hospital.—12 Jun. Med. Graduates. Each £100.
Adelaide University.—Elder Professor of Anatomy and Histology. £1100.
Ashton-under-Lyne, District Infirmary.—Two H.S.'s. Each at rate of £150.
Barnstaple Dispensary, Area of the County of Devon.—Tuber. O. £750.
Bath, Royal United Hospital.—Asst. H.S. At rate of £100.
Bath, Somerset and Wilts Central Children's Orthopædic Hospital, Combe Park.—H.S. At rate of £120.
Bethlem Hospital, Lambeth-road, S.E.—Res. H.P. £25 per quarter.
Birmingham City.—M.O. for Maternity and Child Welfare. £600.
Birmingham General Hospital.—Med. Reg. and Res. M.O. £155.
Birmingham, Queen's Hospital.—Med. Reg. £200. Also Res. Anæsthetist. £70–£100.
Bradford Royal Infirmary.—Hon. Asst. P. Also H.P. £150.
Brighton, Sussex Maternity and Women's Hospital.—Res. H.S. £130.
Cancer Hospital, Fulham-road, S.W.—Part-time Research Radiological Asst. 1 gn. each attendance. Also H.S. At rate of £100.
Carlisle, Cumberland Infirmary.—H.P. At rate of £155.
Charing Cross Hospital, W.C.—Hon. Clin. Asst. for X Ray Dept. Also Res. M.O. £350.
Colchester, Essex, County Hospital.—Asst. H.S. and Reg. £120.
Connaught Hospital, Orford-road, E.—M.O. At rate of £150. Also Res. H.P. and Res. H.S. Each at rate of £100.
Derby, Derbyshire County Sanatorium, near Chesterfield.—Res. Asst. M.O. £350.
Doncaster Royal Infirmary.—Third H.S. At rate of £150.
Douglas, Isle of Man, Noble's Hospital.—Res. H.S. £175.
Dover Borough.—Asst. M.O.H. £700.
Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.
Exeter Royal Devon and Exeter Hospital.—H.S. to Special Depts. At rate of £130.
General Lying-in Hospital, York-road, Lambeth, S.E.—Registrar.
Great Yarmouth General Hospital.—Jun. H.S. £125.
Hackney Hospital, High-street, Homerton, E.—Jun. Asst. M.O., £350.
Hereford General Hospital.—H.P. At rate of £150.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Jun. H.P. for Frimley Sanatorium. At rate of £100.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Med. Reg. £100. Res. M.O. Also H.P. At rate of £150 and £100 respectively.
Hospital for Sick Children, Great Ormond-street, W.C.—Res. M.O. At rate of £250.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.P. At rate of £100.
Huddersfield Royal Infirmary.—Jun. H.S. At rate of £150.
Ilford Emergency Hospital.—Hon. Radiologist. £50.
Jersey General Hospital, &c.—Res. M.O. £260.
Kingston-upon-Hull City and County.—Asst. M.O.H. £600.
Kingston-upon-Thames, Surrey County Mental Hospital.—Third Asst. M.O. £300.
Leeds University.—Cancer Research Fellowship. £500.
Leicester, Leicestershire County Council.—Asst. County M.O.H. £650.
Lincoln County Hospital.—Jun. H.S. At rate of £150.
Liverpool County Borough.—Jun. Asst. Sch. M.O. £600.
Liverpool, Royal Southern Hospital.—Medical Tutor and Registrar.
Macclesfield General Infirmary.—Second H.S. At rate of £150.

Manchester, Baguley Sanatorium.—Sen. Asst. M.O. £500. Also Asst. M.O. £350.
Manchester, Royal Infirmary.—Asst. M.O. for Massage and Electrical Dept. At rate of £100.
Manchester, Salford Royal Hospital.—Cas. H.S. At rate of £125.
Manor House Hospital, Golders Green, N.W.—H.S. At rate of £200.
Miller General Hospital, Greenwich-road, S.E.—Orth. H.S. At rate of £150. Hon. Surgeon. Also Hon. Physician to Skin Dept.
Plymouth City.—Asst. M.O.H. for Maternity and Child Welfare Dept. £600.
Portsmouth Dockyard and Government Civil Establishments Medical Society.—M.O.
Portsmouth Royal Hospital.—Sen. H.S. At rate of £175. Also H.P. and two H.S.'s. Each at rate of £130.
Preston and County of Lancaster Royal Infirmary.—Res. Surg. O. £300. Also H.S. At rate of £150.
Queen's Hospital for Children, Hackney-road, E.—H.P., Cas. O., and H.S. All at rate of £100. Also Clin. Asst. for Orthopædic Dept. 5s. each attendance.
Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.
Rotherham Hospital.—H.P. £180.
Rotherham Union Hospital, Alma-road.—Res. Asst. M.O. £125.
Royal London Ophthalmic Hospital, City-road, E.C.—Sen. H.S. £150.
Royal Naval Dental Service.—Dental Officers.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Gynæcological Reg. Also H.S. At rate of £100.
St. Helen's County Borough.—Tuber. O. £600.
St. John's Hospital, Lewisham, S.E.—Radiologist. Also Res. M.O. At rate of £100.
St. Mary's Hospital, W.—Asst. Ophth. S. Also Asst. S. for Diseases of the Ear, Nose, and Throat.
St. Peter's (Whitechapel) Hospital, Vallance-road, E.—Res. Asst. M.O. £450.
Sheffield Royal Hospital.—Res. Anæsthetist. £80.
Sheffield, South Yorkshire Mental Hospital.—M.O. £400.
Stroud General Hospital.—H.S. At rate of £125.
Torquay, Torbay Hospital.—Hon. Anæsthetist.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Hon. Med. Reg. Also Hon. Surg. Reg.
West Bromwich, Hallam Hospital.—Res. H.S. £250.
West End Hospital for Nervous Diseases, Welbeck-street, W.—Hon. Asst. Physician.
West London Hospital, Hammersmith, W.—Asst. M.O. At rate of £450. Also three Jun. Asst. M.O.'s. Each at rate of £350.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. Non-res. H.S.'s. At rate of £150 and £100 respectively.
Wolverhampton, Royal Hospital.—H.S. At rate of £150.
Worcester General Infirmary.—Jun. Res. M.O. £120.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Southall (Middlesex) and Mevagissey (Cornwall).

Births, Marriages, and Deaths.

BIRTHS.

BLACKWELL.—On Oct. 10th, at Maison Bruges, Don-road, Jersey, the wife of Dr. A. S. Blackwell, of a daughter.

RITCHIE.—On Oct. 3rd, at Laggan, Epsom, the wife of Dr. R. H. A. Ritchie, Benhill-avenue, Sutton, Surrey, of a daughter.

WATKINS.—On Oct. 7th, at "Eskdale," King's Lynn, the wife of Dr. E. Holmes Watkins, of a daughter.

WHITLEY.—On Oct. 4th, at Thorneybrook, Chelmsford, the wife of J. T. Whitley, M.B., Ch.B., of a son.

MARRIAGES.

CRAIG—ALLEN.—On Oct. 12th, at St. James's, Birkdale, John Craig, M.D., to Mary Allen, M.B., Ch.B.

DEATHS.

BREMNER.—On Oct. 12th, at St. Giles-street, Norwich, James Morrison Gardiner Bremner, M.B., C.M. Aberd., T.D., O.B.E., Lieut.-Colonel late R.A.M.C. (T.F.), aged 63.

GAIRDNER.—On Oct. 11th, at "Sans Souci," Cheltenham, Matthew William Gairdner, M.B. Edin., aged 79.

N.B.—A fee of 7s. 6d is charged for the insertion of Notices of Births, Marriages, and Deaths.

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Notes, Comments, and Abstracts.

SOME OF LETTSOM'S CONTEMPORARIES.

Being the Presidential Address delivered to the Medical Society of London on Oct. 14th

BY DONALD ARMOUR, C.M.G., F.R.C.S. ENG.,
SENIOR SURGEON TO THE WEST LONDON HOSPITAL.

GENTLEMEN,—My first duty on taking this honourable and ancient chair of President of the Medical Society of London is to offer you my sincere thanks and appreciation for the very great honour you have put upon me. To be mentioned amongst the long list of holders of this distinguished office is, indeed a satisfaction, but one tempered by a sense of responsibility and some misgiving, lest one fall short of the high standard set by my predecessors in the past 156 years.

Our founder, John Coakley Lettsom, was born in 1744 and died in 1815. During this period of 71 years great historic events took place which had a lasting effect upon the destinies of peoples. His generation witnessed historic episodes, whose dramatic interest equalled the importance of the changes they effected in world history. As a lad of 15 Lettsom must have gloried and grieved with all England at the news of Wolfe's death and victory at Quebec, which won us Canada, and lost us one of our greatest soldiers. In those years, too, Clive was giving us India, though a less glorious death awaited him.

During the next 25 years the aspect of the world had changed. The birth of the United States of America, made possible by Wolfe's victory, had taken place. At middle age Lettsom witnessed the cataclysm of the French Revolution, and all the mighty episodes of the Napoleonic wars marked his declining years. It was an age of enlightenment, of the revolt of the intellect against tradition and prejudice. It was the golden age of benevolent despots, from Catharine II., Frederick the Great, and the noblest and least successful, Joseph II., to lesser rulers throughout Europe. It was largely owing to their efforts that the enlightened ideas were spread.

Momentous changes were taking place in almost every branch of literature and thought, so that the time of Lettsom witnessed the final emancipation of the human intellect. In no direction was this more marked than in medical thought and teaching. For, prior to this time, very little was accomplished, if we except the work of Harvey, which has withstood the test of time. Based largely on metaphysical speculation, the theories of medicine could not withstand the test of scientific proof. It was, indeed, an age of theories and system-makers. Linnacus (1707–78), Stahl (1660–1734), Cullen (1710–90), Hoffmann (1660–1742), Erasmus Darwin (1731–1802), "the disputatious and disreputable" Brown (1735–88), as Allbutt described him, and Boerhaave (1668–1738), were all propounders of a "succession of forgotten theories." The effects produced upon medicine by these systems has been well described by Arnold Chaplin in his paraphrase from Lord Morley's "Voltaire." "For all the systems we see only dismal tracts of medical darkness, we hear only the humming of the doctors as they serve forth, to men thirsting after knowledge, the draff of a medical superstition."

But the dawn of a better day was at hand. The days of pure speculation, or of any general belief in pure speculation, were over, and in their place arose the burning desire to solve the mysteries of pathological processes. After smouldering for some 70 years the fires of progress in the sciences of Physiology, Chemistry, and Anatomy leapt again into flame, and burned with a renewed brilliancy during the period we are discussing.

The Dawn of Physiology.

Albrecht von Haller (1708–77) was the author of the first great modern treatise on physiology. Born at Berne, he graduated at Leyden, and spent 17 years at the newly established University at Göttingen, where he taught all branches of medicine, established Botanic Gardens, wrote some 13,000 scientific papers, and incidentally did some of his best experimental work. Nor were his energies limited to purely scientific work, for he stands in the first rank of our medical poets and historical novelists. In 1734 his application for the post of City Physician at Berne was rejected, with the comment, "He is a poet; why should he want to be a hospital physician?"

"His scientific work has long since passed into the impersonal stage, but to his credit stand researches of the first rank in the irritability of muscle and nerve, a demonstration of the myogenic theory of the heart's action, and an admirable and accurate account of the mechanics of the heart's action" (Osler). To read "Haller redivivus," by Kronecker, is to

realise how many so-called "new" discoveries are foreshadowed in his works. Haller remains one of the outstanding figures of the eighteenth century.

Electrophysiology had its origin in Galvani's epochal discovery of animal electricity. Galvani (1737–98) was born in Bologna and began studying theology, but early turned to anatomy and physiology, became Professor of Anatomy in 1762, and practised surgery and midwifery. His wife, Lucia Galeazzi, was intimately associated with him in his great discovery. It was followed up with great skill and comprehension by Volta (1745–1825), who was Professor at Pavia. "Who," says Helmholtz, "when Galvani touched the muscles of a frog with different metals, and noticed their contraction, could have dreamt that all Europe would be traversed with wires, flashing intelligence from Madrid to St. Petersburg, with the speed of lightning? In the hands of Galvani, and at first, even in Volta's, electric currents were phenomena capable of exerting only the feeblest forces, and could not be detected except by the most delicate apparatus. Had they been neglected on the ground that the investigation of them promised no immediate results, we should now be ignorant of the most important and most interesting of the limits between the various forces of nature."

Physicists and Chemists.

To the physicists and chemists of the day we owe the completion of the modern theory of respiration. This was based upon the discovery and isolation of the different gases in the atmosphere—viz., carbon dioxide by Black (1757), hydrogen by Cavendish (1766), nitrogen by Rutherford (1772), oxygen by Priestley and Scheele (1771) and Lavoisier (1775).

Priestley (1733–1804), confused by his adherence to the false theory of Stahl, only saw respiration as "the phlogistication of dephlogisticated air." It was left to the genius of Lavoisier (1743–1794) to reveal the true nature of the interchange of gases in the lungs, and to bury, once and for all, the phlogistion theory.

"The middle of the seventeenth century saw the profession thus far on its way—certain objective features of disease were known, the art of careful observation had been cultivated, many empirical remedies had been discovered, the coarser structure of man's body had been well worked out, and a good beginning had been made in the knowledge of how the machinery worked—nothing more. What disease really was, where it was, how it was caused, had not even begun to be discussed intelligently." The best of men had little or no appreciation of the importance of the study of the changes wrought in the body by disease. Sydenham scoffed at the value of post mortems. The first time that anatomical knowledge was systematically applied to the service of medicine was in the great work, "de Sedibus et Causis Morborum per Anatomen indagatis," published in his seventy-ninth year by Giovanni Battista Morgagni (1682–1771). It was the foundation of modern pathological anatomy, or, as Virchow said, the introduction of the "anatomical concept" into medical practice It was the first time that the records of post-mortem findings were correlated with clinical records to any large extent. This work, "one of the great books in our literature" (Osler) was translated into English by Benjamin Alexander in 1769, and had a very great influence upon the development of medical science.

Another publication, contemporary with that of Morgagni, should be mentioned, having as it did a profound influence upon the clinical medicine of the future. Leopold Auenbrugger was born at Gratz, in Styria, on Nov. 19th, 1722. Though the son of an inn-keeper, he received a University education, and his medical training was obtained under Van Swieten, a great authority of that time. In 1751, at the age of 29, Auenbrugger was appointed physician to the Spanish Military Hospital in Vienna. After seven years' observation and testing of his method he published, in 1761, his epoch-making volume, entitled, "Inventum novum ex percussione thoracis humani, ut signo, abstrusos interni pectoris morbos detegendi." The new method was, however, practically unrecognised by the clinicians of his time. It was left to Corvisart, physician to Napoleon and leader of medical thought in France, to obtain for Auenbrugger's work its proper recognition. This was 47 years after its first appearance in Germany, and just one year before Auenbrugger died in 1809.

Morgagni's influence upon medicine was further strengthened and increased by the work of Bichat (1771–1802), who in his all too short life of 31 years, some of it spent as a surgeon in the French Revolutionary Army, showed himself a master-worker in scientific medicine and anatomy. His "Traité d'anatomie descriptive" in five volumes, and his "Anatomie générale, appliquée à la Physiologie et à la Médicine," entitle him to be called the creator of descriptive anatomy, and opened out an entirely new field for anatomists. Like Hunter, he regarded disease as an alteration of vital properties or principles. That in his "Physiological Researches upon Life and Death" he adhered to an obsolete belief, which he summed up in his famous definition of life as "the sum of the forces that resist death," does not detract from his great scientific attainments. His studies laid the foundation of modern histology.

Morbid Anatomy and Matthew Baillie.

It was in this country that the coping-stone was placed upon this building up of the science of morbid anatomy. Matthew Baillie (1761–1823), a nephew of the Hunters, published in 1793 his work, "The Morbid Anatomy of some of the Most Important Parts of the Human Body." It was the first book in English on the subject, and the first in which morbid anatomy was treated as a subject by itself. Baillie has been called the "father of medical pathology." Morgagni's work, which may be regarded as the foundation of the study of diseased structures and organs, is long, intricate, and difficult of reference. Baillie's work, illustrated by William Clift, is characterised by its conciseness and its accuracy of observation.

A contemporary estimate of his work shows how warmly it was received on its appearance. "Though former writers had treated this subject (morbid anatomy) in innumerable volumes, it was to be regretted that before Dr. Baillie's time there was no regular system or method of arrangement pursued by them which could render this study useful. Dr. Baillie, by a nice and accurate solution of the morbid appearances of every part of the body, and the peculiar symptoms which in life distinguish them, placed in a narrow and clear compass an extensive and valuable mass of information, before his time contemptible." It exerted a profound influence upon medical teaching, not only in this country, but abroad as well.

These, then, were the contemporaries of Lettsom, who did most to influence the development of medicine in his day. Others there were, though of less renown, who worked quietly in their modest way to advance some particular branch of our profession.

Hewson (1739–74), an almost forgotten English physiologist, first a pupil of the Hunters, then a partner at the school in Great Windmill-street, was awarded the Copley Medal for his work on the lymphatics, while modern research has confirmed his views upon coagulation of the blood. Knowledge of the physiology of digestion was advanced by the work of de Réamur (1683–1757), and confirmed by Spallanzani; while Cruikshank, the Physician of Dr. Johnson in his last illness, and Whytt, both of Edinburgh, were pioneers in the physiology and pathology of the nervous system.

William Withering (1741–99), a Shropshire graduate of Edinburgh University, was one of the ablest clinicians of his time, and one of the greatest medical botanists, hence his title, "the flower of physicians." He was a pioneer in the correct use of digitalis. He had learned from an old Shropshire woman that foxglove was good for dropsy, and then began trying it in heart disease, and recommending its use wherever he could. In this he was firmly opposed by Lettsom, who, in that day, enjoyed the largest and most remunerative practice in London. Lettsom, on the recommendation of Withering, had prescribed digitalis in eight cases, all of which terminated fatally. Its use had led to the fatal result of the last illness of Charles James Fox. Lettsom published his cases, and warned the profession against the use of the drug.

William Heberden (1710–1801), whom Johnson styled "Ultimus Romanorum," the last of our great physicians, is remembered by his descriptions of varicella, angina pectoris, and the nodules of arthritis deformans. His *Commentaries*, as Dyce Duckworth has pointed out, are rich in clinical minutiæ.

John Fothergill (1721–80), a Quaker, pupil of Monro primus, and friend of Lettsom, is commemorated in this Society by the medal which bears his name. He was employed by Monro in revising his work on Osteology, and he was the first graduate of Edinburgh University to be admitted to the Royal College of Physicians of London. His "Account of the sore-throat attended with ulcers" ranks as a classic amongst the descriptions of diphtheria, and he was the first to describe the condition we know now as tic douloureux. He established at Upton, in Essex, the finest botanical garden to be found in Europe at that time. Having family connexions and many friends in America, it was only natural that he showed great sympathy for the American colonies, advocated the repeal of the Stamp Act, and was associated with Benjamin Franklin in a plan for reconciliation with the Mother-country. Of him Franklin said, "I can hardly conceive that a better man has ever existed." And J. F. Payne defines his place in the profession in the following words: "He will always remain an important representative of the naturalistic and anti-scholastic tendencies of English medicine in the latter half of the 18th century."

Towards the end of the century came one of the greatest triumphs in preventive medicine, the introduction of vaccination by Edward Jenner (1749–1823). The life and work of this friend and pupil of John Hunter's are, like the latter's, too well known to us all to need recapitulation here.

The great centre of the teaching of anatomy at the beginning of the eighteenth century was Paris. It was due to the Monros, who held the Chair of Anatomy in unbroken succession for 126 years, that Edinburgh became a great centre of medical teaching at this time. But many of the anatomists of this period were surgeon-anatomists, and most of their work was topographical. Surgical anatomy had, in fact, its birth at this time. This, too, was the age of anatomical illustrations, and Cheselden, Haller, William Hunter, Albinus, and Scarpa all produced masterpieces of artistic talent.

Surgery and Surgeons.

What of surgery and surgeons during Lettsom's period? During the greater part of the eighteenth century the status of surgery was very low, with the possible exception of French surgery. In England there were no surgeons of first rank before the time of Cheselden, Pott, Hunter, and Abernethy. In Germany, surgery had to wait until the time of Frederick the Great before being taken out of the hands of the barber, the executioner, and the strolling bone-setter. The Surgeon-General of the Prussian Army was a barber. The Prussian Army Surgeon of this time ranked above a Drummer but below a Chaplain.

Up to the time of John Hunter Paris was the only place where surgery could be properly studied. Desault, the teacher of Bichat, Venel, the originator of surgical orthopædics, David of Rouen, who wrote contemporaneously with Pott on caries of the spine, Chopat and Moreau, were the most notable of French surgeons.

Of German surgeons, Johann Bilguer, Surgeon-General under Frederick the Great, is notable as the author of the first plea for conservative surgery of the joints, and August Richter for his classical treatise on hernia. Cheselden, surgeon to St. Thomas's Hospital, died when Lettsom was eight years old, so does not come strictly into this period.

Charles White (1728–1813), of Manchester, was the most eminent surgeon in the north of England. He excised the head of the humerus in 1768, and introduced the method of reducing dislocations of the shoulder by placing the heel in the axilla. Incidentally, he was the first to describe phlegmasia alba dolens.

Percival Pott (1714–88) served St. Bartholomew's Hospital "man and boy for half a century." His writings, only commenced when he was 42 years of age, exercised a very great influence upon surgery during the last half of the eighteenth century. D'Arcy Power has said that Pott's name is better known on the Continent than that of any other English surgeon except Lister—better even than that of John Hunter—by the rank and file who have no knowledge of the history of surgery. "Mentally, he was not much in advance of his time, for scientific surgery had not yet come into being, and he was essentially a clinical surgeon. For the most part he stood on the old ways and followed the old lines of treatment, but he straightened out and made plain the paths, so that his followers walked along them most easily, and were able to go further" (D'Arcy, Power).

In Edinburgh John Bell (1763–1820) was the outstanding figure in surgery at the end of the eighteenth and beginning of the nineteenth centuries. His "Principles of Surgery," illustrated with beautiful original engravings, and full of historical and clinical matter, is a monument alike to his skill as a surgeon and to his artistic talents as an illustrator. Unfortunately his quarrels with Benjamin Bell and Munro secundus did much to impair his popularity and to keep him out of the Royal Infirmary. But with Desault and John Hunter he must be regarded as a founder of the surgery of the vascular system.

All the surgeons up to this time were clinical surgeons and knew nothing of pathology. In spite of the publication of Morgagni's great work pathology as a science had no real existence. For example, though Mestivier in 1759 was the first to record an operation upon a case of disease of the appendix and to describe the post-mortem findings, and though Lamotte, in 1766, gave the first account of fæcal concretions in the appendix, they seemed to have made no impression whatever upon the minds of the profession.

It is only with the coming of John Hunter (1728–93) that surgery began to take its place as a branch of scientific medicine, firmly based upon physiology and pathology. It ceased to be regarded as merely a technical method of treatment.

D'Arcy Power pertinently asks the question why is Hunter looked upon, by those who know, as the greatest of surgeons? "He was a bad lecturer, a confused thinker, and a very indifferent writer, yet he found surgery mediæval and clinical; he left it a science." The answer is in his museum, where the whole science of surgery is displayed in terms of morbid anatomy, comparative as well as human.

His devoted pupil John Abernethy (1764–1831) was the immediate successor of Hunter, and constituted himself the champion of his master's theories. But his activities are mainly after Lettsom's time.

Early Presidents of the Medical Society.

These contemporaries of Lettsom were the "giants" of the profession. But what of the lesser lights, his everyday associates here in London, and in this Society, which he was instrumental in founding? During the 42 years from its foundation until Lettsom's death the Medical Society knew 11 different presidents. He himself had held the office three times, while his friend, James Sims, held it for no less than 22 years. Of these 11 presidents five were graduates of Edinburgh University, so it is evident that the invasion of London from the North had already commenced!

Our first President was John Millar, who was born in Scotland in 1733, and, after graduating at Edinburgh University, commenced to practise at Kelso. On being appointed physician to the Westminster General Dispensary, afterwards Westminster Hospital, he settled in Pall Mall and became an active promotor of this Society. He died in 1805. Millar was an excellent physician, though eccentric and irritable. He seems to have specialised in diseases of women and children, and wrote largely on asthma, whooping-cough, and the prevailing diseases in Great Britain. To Millar the elder Benjamin Rush, of Philadelphia, addressed in 1770 his dissertation on "The Spasmodic Asthma of Children," in which he acknowledged his obligation to Millar's "excellent treatise" on the subject.

Our third President, Nathanial Hulme, was a Yorkshireman. Born at Hulme Thorpe, near Halifax, in 1732, he was a student at Guy's before entering the Navy as surgeon's mate. He graduated M.D. at Edinburgh in 1765 and settled in Hatton Garden. He was appointed physician to the City of London Lying-in Hospital, an office which did not include obstetric practice, and was not tenable by a accoucheur. On March 17th, 1774, he was elected physician to the Charterhouse, by the interest of Lord Sandwich, First Lord of the Admiralty, and removed to Charterhouse-square, where he resided until his death. On 18th January, 1777, he gave the Oration before this Society. In 1787 he received a Gold Medal from the Medical Society of Paris upon the subject of "Sclerosis of the Cellular Tissue in the New Born." He was elected F.R.S. in 1794. He died on March 28th, 1807, from the effects of a fall from the roof of his house, to which he had ascended to observe the damage done to the chimneys by a hurricane. He was buried at his own request in the Pensioners' Burial Ground of the Charterhouse.

Our fourth President, George Edwards, was born in 1752, and graduated at Edinburgh University in 1772. He was an untiring promotor of political and social schemes, none of which appear to have attracted any attention. He was a prolific writer in support of his self-imposed mission, and the British Museum contains no less than 42 of his books. One of them is significant and is entitled "A certain way to save our Country and to make us a more happy and flourishing people than at any former period of our history."

The next, and fifth, holder of this office, Samuel Foart Simmons, was born at Sandwich, in Kent, in 1750. He studied at Edinburgh and Leyden, where he took his degree in 1776. After visiting the principal medical centres on the Continent he settled in London, and in 1781 he was appointed physician to St. Luke's Hospital and became a recognised authority on mental diseases. So much so that he was finally called in to take charge of George III when that monarch had his third relapse of mental disorder, and it is probable that it was only then that he received anything like capable and judicious treatment. In 1779 Simmons published a Medical Register, the first time any attempt had been made to gather together any particulars of our profession and its activities. The Register appeared only three times, in 1779, 1780, and 1783. He was also the first editor of *The London Medical Journal*. Simmons was elected a Fellow of the Royal Society in 1779, and in addition he was a Member of the Society of Antiquaries, a Fellow of the Academies of Nantes, Montpelier, and Madrid, of the College of Physicians of Lorraine, and of the Royal Society of Medicine of Paris, as well as an Honorary Member of the Medical Society of Edinburgh and the Philosophical Society of Manchester. He died on 23rd April, 1813, at his house in Poland-street, and was buried at Sandwich.

John Sims, our sixth President, was born at Canterbury in 1749. His inaugural thesis on taking his M.D. at Edinburgh in 1774 was entitled "The uses of cold water internally." To a graduate of Edinburgh it would not appear that this subject allowed much scope for discussion! He settled in London and practised largely as an obstetrician. In 1780 he was appointed physician and man-midwife to the Lying-in Charity and Physician to Princess Charlotte. John Sims, was, moreover, a noted botanist of his day, and is said to have introduced stramonium for the treatment of asthma into this country. His herbarium is now at Kew. He died at Dorking in 1831.

Our next President, John Whitehead, had a varied career. He was born in Cheshire about 1740, of humble parentage. Early in life he was converted by a Methodist preacher and joined the Wesley movement. After acting as a lay preacher at Bristol he married and set up as a linen draper. Removing to London, he joined the Society of Friends, and conducted a large boarding-school at Wandsworth. Then Barclay, the brewer, offered him a life annuity of £100 to travel with his son on the Continent. He accepted, and on reaching Leyden he entered as a medical student in 1779, and graduated M.D. in 1780. On returning to London he became, through Lettsom's influence, physician to the London Dispensary. In 1784, the Society of Friends pushed his candidature for the post of physician to the London Hospital, but his election was declared invalid owing to some slight irregularity. He left the Society of Friends and again became a Methodist. He was Wesley's medical adviser and preached his funeral sermon. He died at Fountain Court, Old Bethlem, in 1804.

Of our eighth President, John Relph, I can tell you little. He was a native of Cumberland and entered Leyden in 1778, graduating M.D. the same year. He was made a Licentiate of the Royal College of Physicians in 1784 and elected a physician to Guy's Hospital in 1789. He died in Mark Lane in 1804.

The form and features of our ninth President, James Sims, are familiar to us all, sitting, with a cocked hat upon his head, in the Presidential Chair, as painted by Medley in the picture of our founders. He is described by a contemporary surgeon (Wadd) as "a good-humoured pleasant man, full of anecdote, an ample reservoir of good things, and for figures and facts a perfect chronicle of other times." Needless, after this, to say he was an Irishman, born in Co. Down in 1741. He took his M.D. at Leyden in 1764 and practised for a time in Tyrone. On removing to London he received very great assistance from Lettsom, and soon acquired a lucrative practice. He served this Society as President for 22 consecutive years, being finally displaced only by the strenuous exertions of the younger Fellows. The revolt was led by Marcet, physician to Guy's, and Yelloly, physician to the London Hospital. A contemporary account of the secession, which resulted in the formation, in 1805, of the Medical and Chirurgical Society, is not without interest, even though not perhaps pleasing to our amour propre. "This Society (The Medical Society), like many others, has become, from the increasing extent of the profession, too numerous in its members, and it has been alleged not so select at all times. From this cause, dissensions arose, but as good, at times, issues from apparent evil, it gave rise to the Medical and Chirurgical Society, a most elevated establishment, and which was formed purposely with a view to exclude the lower orders of the profession." And then follows the sop to Cerebus. "As the Medical Society, however, is the original parent of whatever future institutions may arise for medical improvement, so the founders of it may be said to have deserved well of the profession in general, as first, by their exertions, influence and talents, having set the machine in motion." In 1802 Sims made over his valuable collection of books to this Society, in consideration of an annuity of £30 a year to be paid to himself and his wife, and of £45 annually to the survivor. He retired to Bath a rich man and died there in 1820.

The eleventh President of this Society, George Pinckard, is the first to have served with the Forces of the Crown on active service. Born in 1768 he studied medicine at the then united Hospital of St. Thomas's and Guy's, then at Edinburgh, finally graduating at Leyden in 1792. In 1795 he was appointed physician to the Forces, and in that capacity accompanied Sir Ralph Abercromby's expedition to the West Indies. In 1798 he was in Ireland, and served in the rebellion of that year on the staff of General Hulse. For these services he was promoted to the rank of Deputy Inspector General of Hospitals, and was jointly responsible for the direction of the Medical Department of the Army in the Duke of York's expedition to the Helder. He founded the Bloomsbury Dispensary, and was physician to it for 30 years. He died with tragic suddenness from angina pectoris while examining a patient in his consulting room.

Joseph Adams occupied the Presidential Chair in the year of Lettsom's death. He was the son of an apothecary in Basinghall-street, and attended lectures under Pott at St. Bartholomew's, Saunders at Guy's, and John Hunter at St. George's. He took his degree at Aberdeen in 1796. He is chiefly known as a warm admirer and defender of John Hunter, and published in 1816 "Memoirs of the Life and Doctrines of the late John Hunter, Esq."

These, then, are some of Lettsom's contemporaries. Each in his way has had some part in moulding our practice of to-day. Anatole France says "It is the greatest of frivolities to waste time in cemeteries." But surely the contemplation of the lives and the study of the works of those who have gone before and left an indelible mark upon our profession in the past, are things that none of us can despise. For, as Andrew Lang has said, "The little present must not be allowed wholly to elbow the great past out of view."

A CHILD WELFARE FILM.

A PROPAGANDA film with the title "H.M. the Baby," produced for the Mutual Property Insurance Company by Community Interest Films, Ltd., was shown at the American Theatre, Wardour-street, on Oct. 12th. The story deals with the marriage of a young couple, in spite of opposition by the girl's father, who refuses to receive her or her husband. The young mother attends an antenatal clinic and goes for her confinement to a maternity home, the scenes for this part being staged at Queen Mary's Maternity Home, Hampstead. Eventually the father is reconciled when his grandson, under the guidance of health visitor and infant welfare centre, wins the first prize at a baby show. The film is approved by the Central Council for Health Education, and the intention is to lend it to medical officers of health and other authorities interested in health education.

A NON-PAYING PATIENT.

To the Editor of THE LANCET.

SIR,—For the benefit of my colleagues, both in consulting and general practice, I should like to call attention to the fact that there is abroad in London an individual, whose signs and symptoms are interesting enough to engage attention, but whose bank account is non-existent. She is about 40, short, plump, dark, blue eyes, slight moustache, and the history is one of radical mastoids and a severe intracranial operation on the right side. The signs bear this out, showing, in addition, an hysterical hemiparesis and hemianæsthesia on the right side. Unless they felt repaid by the interest in an amusing case, medical people would be wise not to waste their time or risk their money over her.

I am, Sir, yours faithfully,

Edgware-road, W. Oct. 9th, 1929. H. I. DAVIES.

ADHESIVE BANDAGES AND DRESSINGS.

Messrs. T. J. Smith and Nephew, Ltd., Neptune-street, Hull, and London, Glasgow, and Manchester, have called our attention to "Elastoplast" adhesive dressings and bandages, whose chief feature is that they are easily moulded to the shape of the surface to which they are applied, and that they are non-irritant. The fabric base of "elastoplast" is so woven that it stretches in any direction and the material is available in sizes suitable for various purposes, such as the treatment of varicose veins, the replacement of splints when less rigidity is required, and the dressing of fingers, eyes, and boils. From the fabric, sold in spools, dressings may be cut to meet any emergency. It is obtainable in two styles: in "A" one side is entirely covered with adhesive which allows the patient to take a bath without removing the dressing; in "B" the material is covered with adhesive in strips so as to allow of ventilation. Elastoplast makes a convenient and time-saving addition to the resources of the surgery.

MEDICAL GOLFING SOCIETY.—The autumn meeting of this Society was held at Deal in the Royal Cinque Ports Golf Course on Oct. 12th and 13th, and was attended by over 70 members. The weather was delightful and the course in admirable order. The Selling Sweep Dinner was held at the South-Eastern Hotel where nearly all the members stayed. The competition results were as follows: Singles *v.* Bogey won by Claud Apperley, 2 up, after a four-fold tie with Sir Milsom Rees, G. F. Wilson, and J. Pringle; Foursomes *v.* Bogey won by J. Pringle and J. Collins, all square; and Canny Ryall Cup won by C. V. Mackay (84−12=72), A. Galletly (76), D. A. Davies and C. Max Page (77).

TRAINING OF MIDWIVES.—In the course of a published statement on the report of the Departmental Committee on the Training of Midwives (see THE LANCET, Sept. 28th, pp. 669 and 680), the Council of the Midwives' Institute says that it "views with surprise and strong disapproval the suggestion that the control of the training and curriculum for the profession should be taken over by a Government department, thus eliminating the principle of self-government and self-development from a professional point of view that is accorded to all other professions. And considers that the withdrawal of control from a specialised body on which organised midwives have definite representation and powers would lower the standard of the profession and lessen its attraction for the most suitable women to undertake the serious and responsible part in the struggle against maternal mortality assigned to midwives by the Departmental Committee."